THE

Fruit Grower's Friend.

AN

EASY GUIDE

FOR THE

Raising of Fruits,

FOR

PLEASURE OR PROFIT.

BY

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1880.

New York, American news co.

INTRODUCTION.

BELIEVING that a small work on fruits, giving the newest methods and the most successful ways of growing and cultivating them, would be appreciated, I accordingly offer "THE FRUIT GROWER'S FRIEND" to the public, trusting that the directions and suggestions contained in its pages will enable many a one to derive increased profit, and many an hour of enjoyment in their orchards and gardens. Many a retired merchant, banker or professional man, ladies also, would gladly spend a few hours each day out in the health-giving air, could they find ways for occupying the time pleasantly. I have accordingly, in writing of the different fruits, thrown in a number of suggestions as to experiments that might be made, besides showing what numerous ways there are in which ladies and others can assist in the training and growing of fruits, and without resorting to any severe or unpleasant manual labor.

To those growing fruits for profit, I trust that these pages will prove equally helpful. Full directions are given for planting and growing the different fruits, and careful explanations made of the most approved and least expensive ways of exterminating destructive insects. The information given in regard to the employment of comparatively inexpensive fertilizers for some fruits, as well as that in regard to the use of the best packages for marketing, will, I trust, repay them for many times the cost of this manual.

It has been my object to make this work suitable for ready reference, and though I have crowded into its pages as much reading matter and information as are often found in some books of one hundred pages or more, yet I have endeavored to arrange the different subjects prominently before the eye, so as to be seen at a glance, by turning over its leaves. Knowing that in some sections of the country it is easier to employ certain fertilizers, and to follow some experiments and not others, I have therefore given a number of suggestions on these and other different subjects, which, I am led to believe, will assist in affording both pleasure and profit to the reader.

Every question that has arisen in a large correspondence, of a number of years, in regard to the growing of fruits, will be found answered, I think, in the following pages.

INDEX.

STRAWBERRIES.

THIS delicious fruit (*Fragaria*, of the Latin, or *Fraisier*, of the French) is the most widely cultivated in this country of any of the berries. From Maine to Mississippi or Texas in the South, and in California and other States on the Pacific, the traveller meets with plots of from two to fifty acres, yielding many a rich repast of this wholesome and favorite berry. In many other portions of the world the strawberry finds a home, and for ages past has it delighted kings and peasants with its rich aroma and delicacy of flavor; while bards and poets seem never to tire of singing the praises of "strawberries and cream."

The ease with which the fruit can be grown, and the adaptation of the plants to widely different soils, enable those possessing even the smallest gardens to share in its rich treasures, as a little plot of land only twenty or thirty feet square will furnish many a heaping fruit-dish of ripe, blushing strawberries. Nor are the pleasures derived from strawberries to be limited merely to the season of ripening, as in the form of syrups, preserves, tarts and ices, they prove a welcome addition to the dessert-table at nearly all times of the year.

SOILS.

Almost any soil, that is not water-soaked, will answer for strawberries. A good, deep, moist loam or gravelly soil is perhaps the best for growing the berries in their greatest perfection; but there are probably many more acres of strawberries grown on sandy soils than on any other kind of land. Much is sometimes said about the necessity of drainage. It is a decided benefit sometimes, and at others is entirely unnecessary. Let no one imagine that they must be deprived of the enjoyment to be obtained from this fruit, because they do not care to go to the expense or trouble of draining their gardens. In growing *for profit* on flat or heavy lands, it may sometimes be necessary; but, usually, if the soil is thin, it can be deepened by trenching, or by the use of a subsoil plow, and if low it can be surface-drained by making shallow ditches, or by deepening the paths between the different beds.

When under-draining is decided upon, then a drain may be made with stones, or with boards leaning against each other like the two sides of a roof; or with regular draining tiles of clay. If the soil is sandy through which the drain is to run, then round tiles may be used, or, on loamy soils, half tiles (horse-shoe shaped) may be placed on strips of boards. On very hard clay soils the half tiles may be used without boards. Though, if the expense is no special object, then the complete tiles are, perhaps, the best in the end. In many localities it is much cheaper to use draining tiles than to spend the extra time that is necessary in digging the wider ditches that are required for stone drains. Tile drains should be placed out of reach of frost—usually from two and a half to four feet below the surface, and should have a gradual slope towards their outlet.

MANURES AND FERTILIZERS.

As strawberries are usually placed on land that has been devoted the previous year to corn, or other hoed crops, or to vegetables, there is, of course, considerable manure or plant food still remaining in the soil. Potatoes are thought to exhaust much that is required by the strawberry; but if wood ashes are well worked into the soil with the usual quantity of manure, then good crops can be obtained. A decomposed sod furnishes plant food in large quantities, and by plowing grass lands the previous spring, and growing a crop of corn on the reversed sod, the land may be put into an excellent state for planting. Grass lands may often be made ready for planting in October, if plowed in July or early in August; or, for spring planting, by turning under the sod early in the previous fall.

When it can be so arranged, it is better to make new plantations of strawberries upon ground where they have not been grown for several years, as it is difficult to put back into the soil the necessary fertilizers that have been exhausted. If possible, three or four years should elapse before planting in the same place, though it is possible to get good crops by merely waiting one year. On most soils good cow manure is the best fertilizer that can be applied. Fresh stable manure sometimes proves injurious on sandy

soils, but is good on heavy soils, and usually on lighter soils when well rotted. On very rich soils it is better to use some of the concentrated manures, if the plants are to be stimulated, as some varieties make too much foliage. For this purpose bone-dust, scattered broadcast and worked into the soil before planting or when cultivating, proves one of the best substitutes.

A cheap and excellent combination of fertilizers for most soils, is a mixture of about 400 pounds each of ground bone, wood ashes, muck and marl to the acre. It is sometimes thought to be an advantage to allow it to remain mixed in a heap with some soil for a week or two before using. If marl cannot be easily obtained, then an extra quantity of ashes will do nearly as well. When other manures are used, then a less quantity of bone-dust can be used. Soil from the woods, leaf-mould, rotted turfs, hen manure, guano, superphosphate, and most of the concentrated fertilizers are good, either applied singly, or together, or when made into a compost. Different rows, or different beds may be treated in different ways, thus affording subjects for experimenting. Often, and usually, a single kind of manure is sufficient to obtain good crops; but I have mentioned all the above, as it is sometimes easier and cheaper for some persons to use some of them than others. Hen manure, if used, should be used sparingly, or well intermixed with the soil. At times it is almost as strong as guano. Lime and salt are usually thought to be an injury to the strawberry. For further suggestions, the reader is referred to this same subject under the head of RASPBERRIES.

PREPARING THE GROUND.

The ground should be spaded or plowed at least six inches deep; while sometimes it is spaded or trenched to twice or three times that depth. By having the plow take narrow slices, the manure will be thrown on the shoulder of the preceding furrow, and thus well intermixed, instead of being placed out of reach of the plants at the bottom of a deep furrow. In spading, the same precaution can be taken to throw the soil up against the preceding spadeful. When manure or fertilizers are scarce at time of planting, then they may be placed in the bottom of the furrows or holes where the plants are to be set out—say from four to six inches from the surface. This will give them a good start. The ground should be harrowed or raked before planting.

When plants arrive, the strings inclosing the bundles should be at once loosened to prevent heating, and *the roots* dipped in water. If the plants are wilted or roots very dry, then they can often be revived by keeping the roots in luke-warm water for from one to twelve hours. When the ground is not ready for planting, the plants should be placed in the cellar, or out of reach of frost and winds, and with their *roots* surrounded with wet moss or grass. If necessary, they can sometimes be kept fresh a week in this manner. This same treatment applies also to all the other fruit plants.

DIRECTIONS FOR PLANTING STRAWBERRIES.—If the roots are very long or wilted at the ends, they may be cut off with a knife, hatchet or shears, to within from four to six inches of the crowns of the plants. In the autumn or fall this may be omitted; it is not *necessary* at any time, though sometimes a benefit in the spring. The quickest method and an excellent way when planting largely, is to open furrows with a plow at the proper distances, and then, holding the plant with the left hand against the straight side of the furrow, fill in some soil against the roots with the other hand, or with a hoe or trowel. An assistant might then press the soil firmly with his foot against the roots, if not too wet, and afterwards fill up the furrow, level, or nearly level, with the surface, again "firming it" lightly.

A somewhat similar method for the garden, is to open holes with a spade at the required distances, with the back of the spade against a garden line, and planting as before, spreading the roots like a fan if possible. If planting in a hot sun or when exposed to drying winds, the plants should be kept in pails, boxes or lined baskets, and roots kept moist. The roots are sometimes dried more in ten minutes in the open air, than in going 2,000 miles through the mails. Some persons prefer to dip the roots in a puddle made of clayish soil or muck, when received, also when planting.

Another method for planting, is to push the spade (or trowel) down into the soil, and then by pushing it forward, insert the roots behind the spade without withdrawing it. This is an excellent way when planting in summer or in very dry weather. If the soil is very dry, a pint or two of water may be poured into the cavity. River or rain water, or water that has been drawn and exposed to the air for some hours, is better than *cold* spring water. Next run the spade or trowel down into the soil, about an inch further out, and pry the soil back into place against the roots, and level off the ground.

A fourth method is to dig a hole with a trowel, and after making a little mound in the bottom of the hole, spread the roots around upon it. Next fill in part of the soil, and if very dry pour in some water. A little well rotted manure (not strong fertilizers), if placed in the hole before filling up, will often give the plants a good start. Before finishing, if not too wet, press the soil firmly with a trowel, or moderately firm with the foot, and leave the last half inch of soil loose, so as better to catch the rain or dew, and to prevent the soil from baking. The mound in the bottom may be omitted if time is limited.

DISTANCES FOR PLANTING.—The "hill" system is the favorite method in garden culture, except where the soil is very light and sandy, or overrun with grubs. It merely consists in keeping all runners cut off, thus keeping each plant separate by itself. In garden culture, where the space is limited, the rows may be made either a foot and a half or two feet apart, with plants either eight, twelve, fifteen or eighteen inches apart in the rows. A space two or three feet wide may be left between every three, or four, or five rows, to be used as a walk, or as a dividing line, or as a surface drain. If for the last purpose, it will want to be lower than the rest of the bed. The nearer the rows are to each other, the less mulching will be required. These different distances will give opportunities for experimenting, and all of them might be tried to see which will give the best satisfaction on the soils of each cultivator. Usually, the largest berries are obtained from plants grown by the "hill" system, with the rows two or three feet apart, and plants fifteen inches apart, though more berries are often obtained by planting nearer together.

In field culture, the "hill" system is usually followed if the soil is heavy or of a clayey nature. The rows are then made either two and a half or three feet apart, usually three feet, when about 14,500 plants are required to the acre. If the garden plot is large, and can be arranged so as to permit of horse power, then I would also recommend this same distance of three feet between the rows. Berries usually are sweeter, and ripen more evenly when grown by the "hill" system, as they are more exposed to the sun and air, than when grown in "matted" rows.

The "matted" row system consists in having the rows either three, four or five feet apart, and allowing the runners to take root on both sides of the parent plants. It is followed almost entirely in field culture where the soil is sandy, and frequently on gravelly soils and upon easily worked loams. The plants may be set out at twelve or eighteen inches apart, and the rows being more widely separated require less plants to the acre than by the "hill" system. A "partially matted row" system, is to allow only four or six runners to take root from each plant, cutting off the rest. Excellent crops of fine berries can usually be obtained in this way.

Another method, called the "matted hill system," is to mark off the land both ways, as if for corn, placing one or two plants at every crossing, which may be either three or four feet from each other. Run the cultivator lengthways and also across the row during the season, fastening in the first runners by hand if necessary, and narrowing the cultivator as the "matted hills" become larger. This method requires little hoeing, and gives excellent crops. In gardens, smaller "matted hills" may be made by planting three or four plants together every two, or two and a half feet, or planting one plant and allowing it to make three or four runners.

Another plan for garden or field culture, is to place a plant every two feet, with rows two feet apart, and to cultivate both ways, keeping all runners cut off. It is sometimes surprising to see what a vigorous growth, and what immense crops of large berries, a single plant will give when allowed plenty of room and well cultivated. All of the above plans will give good results, and they each have their supporters among different fruit growers or amateurs.

At the South, in garden culture, I am inclined to believe that where the hill system can be practiced, that excellent results will follow having the rows fifteen or eighteen, or twenty-four inches apart, as the foliage of the plants will then nearly cover and shade the ground, and less mulching will be required between the rows. The "hill system" is probably, also, usually preferable in gardens at the North, even on light sandy soils, provided the plants are kept well mulched. It will be seen that there is here an ample field for experimenting, with its accompanying change of thought and recreation for business or professional men. During the first year, crops of lettuce, dwarf peas, bush beans, spinach, &c., may be raised between the rows in gardens where the hill system is followed, and where space is limited.

HERMAPHRODITE AND PISTILLATE VARIETIES.—The first have *perfect* blossoms, and are easily distinguished from the others, at time of blossoming, by

the long yellow anthers that protrude from among the pistils. In the pistillate or *imperfect* blossomed varieties, only the pistils are visible, appearing closely packed together and of the appearance of a very small strawberry. The hermaphrodite varieties, having perfect blossoms, produce full crops without other assistance. The pistillates are among some of the most productive varieties, but require a bed, or one or two rows of hermaphrodites to be planted within from fifteen to thirty feet of them, if good crops are desired. Varieties blossoming about the same time should usually be selected to fertilize each other. The Wilsons and Monarchs, blossoming early and continuing late, usually do well.

TO PREVENT MIXING OF STRAWBERRIES.—Varieties only become mixed from the runners intermingling so that the plants cannot be distinguished, or from young plants springing up from seeds. This last, however, seldom happens, and when it does, the young plants are usually the same. The intermingling of runners may be prevented by having the different kinds in rows five or six feet apart, and by keeping the cultivator running occasionally during the summer. Another way is to have the different kinds eight or ten feet apart. In the "hill system," where the runners are kept cut, there is of course no danger of their intermingling, even if the rows are only two or three feet apart. When two or more kinds are planted in the same matted row, then the runners may be kept cut from the plants that join, or may be turned away from each other, or a vacancy of a few feet may be left in the row between the different kinds. When understood, it is a matter that can be easily arranged.

CUTTING OFF BLOSSOMS.—Most fruit growers, and especially those who grow fruit for market, make a practice of cutting off all the blossoms from newly set plants, as, when left on, it prevents their making as strong a growth for the main crop of the second year. If any are permitted to remain, it is only upon a few of the strongest plants, and then usually only a single stem or blossom is saved as a sample; though usually the largest specimen berries cannot be obtained except from plants that have been set out at least six or eight months. In gardens where the fruit is wanted, the blossoms may be left on all except the smallest plants, but if planted late in April, or in May or June, the grower will do much better to cut off all except an occasional fruit stem.

CULTIVATION.—Strawberries should be hoed or cultivated *at least* three times the first year; once in May, once in July, and again in August. If it can be done every two or three weeks from early in April until October, then a much stronger growth can be obtained. In the end it is about as easy to cultivate or hoe the ground *frequently*, as to do so only a few times in the season, as more weeds can usually be killed in an hour, when they are only quarter of an inch high, than in three hours when six inches high and wedged in among the plants. When the hoe or pronged hoe is used, the soil should at times be loosened or stirred to a depth of from four to six inches, except close in among the roots, when an inch or two in depth is sufficient. The use of a small plow is also of great advantage in keeping the soil well stirred. Even in the "hill system" the ground should be kept level, not hilled up around the plants.

When using the "matted row" system, the cultivator should always be run in the same direction, after the runners appear, one or two paths north, and the next one or two towards the south, etc., and should be narrowed each succeeding time as the plants spread, until only a path a foot wide is left. A solid bed of plants, three or four feet wide, will thus be formed, quicker and easier than if the young plants are disturbed by pulling round the runners in opposite directions. When following the "matted hill" system, it is also well to drive always in the same direction for the same paths after the runners appear, and to narrow the cultivator as the "matted hill" becomes larger.

DRIVING AWAY THE GRUB.—The strawberry grub is a whitish worm, about an inch long and quarter of an inch thick, that sometimes proves quite destructive by feeding upon the roots of strawberries, and causing the plants to wilt and die. Where they are quite thick, it is usual to grow the plants by the "matted row" system, and to allow the young plants to send out runners, and thus fill up any vacancies. If common salt is sown broadcast at the rate of three or four bushels to the acre, or one or two quarts to a rod, and well mixed with the soil a week or two before planting, it will often drive them away. The same quantity might be applied in a liquid form to hasten the effect, if in a time of drouth.

Another method is to dip the roots in a strong solution of Paris green (a poison) just before planting, if the grubs are thought to be prevalent. Still another plan, said to be

effective in France, is to scatter chloride of lime or a solution around the plants. Soot or wood ashes, or land plaster, or muriate of potash, will perhaps drive them away, but the ashes and potash should be used with caution on sandy soils. Boards laid upon the ground will attract many kinds of grubs, and possibly this variety also. Ground moles are excellent for ridding a plot of grubs, and if the soil is firmed around the plants after being disturbed, will do little injury; toads will possibly assist. Or the parent May-beetle may be destroyed at night in the same way as the codling-moth. Many gardens are free from this grub, and in others only occasionally do we hear of them. Ploughing the land very late in the fall is thought to destroy many of them. When a plant wilts, the grub can often be found at the roots or near by, by digging down at one side. Sprinkling the plant and ground with a solution of chloride of lime or land plaster would probably be the next speediest method to employ. Possibly a solution of whale oil soap would also be effective.

WATERING IN A DROUTH.—One good watering, once or twice a week, in the morning or evening, is better than ten times as often if improperly done. The proper way to do is to draw away a little of the soil from one side, or from around the plant, and allow a pint or more of water to soak in well around the roots. Afterwards replace the dry soil that was removed, and there will be no complaints about the ground baking, while the soil underneath will keep moist for some days longer, on account of the mulching of dry or loose earth on top. A slight watering on the surface often seems to have the effect of burning up or dwarfing the plants. Old fruit or tomato cans, with a small hole in the bottom, and sunk a little ways into the soil at one side of a plant, and filled occasionally with water, are excellent for giving a steady supply of moisture.

MULCHING STRAWBERRIES.—This should be done a month or two before the time of fruiting, in order to keep the green or ripe berries from being spattered, during rain storms, with sand or mud. It also assists in retaining moisture in the soil, and, consequently, in obtaining much larger berries. Under this same heading in Raspberries, directions are given for mulching; also suggestions as to what materials to use. Tan-bark or saw-dust (if rotted) can be used, but should be gathered up after the fruiting season, unless on clayey soils. Boards, with or without other mulching, are excellent for keeping the soil moist, and also from getting hardened during the picking season.

At the extreme south the mulching should be placed around the plants earlier in the season, and kept on during the summer, changing it from one path to another, if any cultivation is performed. If a few young plants are wanted, then the runners may be allowed to take root in an occasional vacant path.

GROWING LARGE BERRIES.—Much, of course, depends upon the variety; but, having selected the right kinds, it is not difficult to greatly improve over the ordinary ways followed. Apply well-rotted barnyard manure from one to three inches thick, and have the ground spaded or plowed deeply—even twelve or eighteen inches if the soil is good, and in a way to thoroughly mix the manure with the soil. A quart or two of bone-dust or other fertilizer to each square rod may afterwards be spread broadcast, and mixed six inches down, but is not necessary. Cultivate or hoe frequently during the spring and summer, keeping the runners closely cut. Give winter protection, and hoe or dig the ground three or four inches deep previous to time of blossoming in spring. In May, mulch the plants well, and a rich reward will duly appear.

Extra-sized berries can also be often obtained by leaving only one-fourth or one-half of the fruit stems to each plant, and clipping out a number of the inferior berries on each stalk. Old fruit cans, arranged to let the water out slowly, will help to swell the fruit to large proportions, if placed near the plants, and frequently filled with water. Half a teaspoonful of ammonia (hartshorn) may be added with benefit to each quart of water when watering. If, in November, the ground *between* the plants is covered thickly with rotted manure, before giving winter protection, it will greatly add to the quantity and size of the berries. Thinning out the fruit stalks or berries is seldom practiced.

WINTER PROTECTION.—In the fall, just before the ground commences to freeze, or within two or three weeks afterwards, strawberry plants should be mulched or covered with some coarse material, to prevent them from alternate freezing and thawing during the winter or spring. Rye or wheat straw, or course manure, are most generally employed for this purpose, spreading about one inch thick. In this latitude, a cheap and excellent covering for narrow rows is to cover with from one to three inches of soil.

Evergreen boughs, pine needles, salt or marsh hay, or other coarse material that will not pack closely and smother the plants, are all good.

A mulching of corn-stalks, placed crosswise, will answer. If the ground is first covered with rotted manure, great benefit will usually be obtained. It may be lightly dug under in spring. Leaves sometimes smother the plants. Many persons use them, however, adding an inch of soil to keep them in place. Scattered thinly over matted rows, and with a *very little* soil scattered here and there over them, is a better way to employ them.

If the mulching material of straw, etc., is applied at the commencement of a rain or snow storm, it will seldom need any poles to keep it from blowing off. Another method of mulching is to sow oats thickly over the beds about September 1st, and allow the straw to fall down and cover the plants. Most growers allow the mulch of coarse manure, straw, salt hay or pine needles to be left on until after fruiting, merely removing the mulch from over the crowns of the plants in the spring, if too thick. Coarse manure becomes bleached by that time, and is sufficiently clean. In removing the mulch, wait until about the time that the ground ceases to freeze and thaw.

CULTIVATION THE SECOND YEAR.—When the time can be given, I prefer to have the mulching removed, early in April, from all except the matted rows. If plants are covered with leaves, soil, corn-stalks or evergreen boughs, it must, of course, be done. After hoeing or spading the ground from two to three inches deep, it may be again placed around the plants and in the paths. The soil should not be disturbed while very wet, nor after the plants are in blossom. The paths between the matted rows may also be spaded at this time, and be mulched again some weeks before fruiting. Though I consider it to be an advantage to give shallow cultivation occasionally in the spring, yet, if entirely dispensed with, good crops may still be obtained.

PICKING AND MARKETING STRAWBERRIES.—The fruit will keep in much better condition, and sell at higher figures, if carefully picked with half an inch of the stem attached. The stem and "hulls" allow the air to circulate more freely among the berries. In the New York markets the berries are usually sold in quart baskets that are packed in 32-quart, well-ventilated crates. Pint baskets are also frequently used. Pickers are usually paid from one to two cents a quart, in money or tickets, and if an extra quarter cent or half cent per quart is promised them for all that they will have picked, if they remain to the end of the berry season, then stampedes, which are common in some localities, may usually be avoided.

UTILIZING THE CAT.—There is a saying, that "he who makes two blades of grass to grow where only one grew before, is a public benefactor," and if a spirit of industry can be infused into this hitherto indolent creature, and agriculture thereby benefited, then the world will be so much the gainer. In this educating of the cat in usefulness, the following plan is sometimes followed, when birds are making too vigorous inroads upon the berries: A wire is stretched about a foot high along one side, or between two strawberry beds, and the cat fastened to this wire, by means of a collar and key-ring. Being attracted by the birds, it keeps moving from one end of the bed to the other, thus frightening them away, if not set to guard too large a space.

Though most birds usually do more good than harm in a fruit garden, yet, in some localities, the fruit grower in self-defense is obliged to drive them off with a shot-gun, or in some other way. A method, said to be effective in dazzling the birds and in frightening them off, is to take strips of *blue* and *scarlet* calico or flannel, one and a half feet long, and occasionally fasten one of each color, a foot from each other, to a line stretched six feet above the ground.

Another method to drive away the birds, is to fasten two common square looking-glasses, back to back, and suspend them from a bent pole in the middle of the field or garden. The birds cannot comprehend it, as it revolves and flashes its light all over the field. Another plan is to suspend small strips of bright tin to a long line. Still another way is to stretch fine brown, or white, or gray linen thread or silk, and support it two inches above the ground, on little stakes; or wind it around raspberry bushes, or other plants or trees where the fruit is being eaten. There is something mysterious in the invisible threads that they do not readily comprehend. However, these methods will seldom have to be resorted to.

AN EXPERIMENT IN DRY SEASONS.—Those who have tried it say, that the size of the berries can be greatly increased by covering the entire bed with two or three

inches of straw or coarse meadow hay, at time of fruiting. Remove it to another part of the bed after the second or third day, and allow the berries to ripen in the sun. This extra mulching may be thus kept doing double duty on every alternate day. Irrigation is often employed to advantage; also, watering by hand, or from carts arranged to distribute the water over the rows.

TREATMENT OF PLANTS AFTER FRUITING.—Plants grown in "matted rows" are usually allowed only to bear one crop, and are then plowed under, and the ground at once planted with tomatoes or winter cabbages, or sown with turnip seed, sweet corn, buckwheat or other grain. When this is the custom, a new plot of strawberries is made each spring. Sometimes, when the weeds are not very bad, the beds may be cleaned up, and the paths spaded or plowed, and occasionally cultivated during the season. A top-dressing of fine manure, bonedust, or other fertilizer, should be given in such cases. Another way is to mow down all except a narrow strip in each matted row, rake off the foliage, and plow or spade up all except the strips that have been left—first manuring the ground if possible. New runners will soon appear, and, by using the cultivator, as in the preceding year, new "matted rows" will be formed.

Old beds grown by the "hill system" are more easily managed. Apply manure or fertilizers, plow or spade up the soil, hoe out the weeds, and loosen the soil in among the plants. Cultivate afterwards the same as the first year. I do not recommend cutting off the foliage, except in wet seasons; however, if the leaves on the south half of each plant are left a partial shade will yet remain. An inch or two of fresh soil from the paths or elsewhere, is a decided benefit if placed around the plants. By filling up the paths each fall with an inch or two of manure, and by cleaning out the beds immediately after fruiting, plants grown "in hills" and given good cultivation, will often give fine crops for from three to six years.

"Matted hills" may be renewed by spading or plowing up all except one corner or the center of each hill. Beds growing broadcast can be made to produce good crops, by spading up all except narrow strips of the youngest plants, and by working in plenty of fine manure, or hen manure, etc., among the plants. As plants "run out," or usually lose their vigor after being planted in the same place for three or four years, it is accordingly best to obtain a fresh supply from outside or distant parties every few years.

SUMMER PLANTING.—When planting in the summer or fall, or in the warmer days of spring, it is usually necessary to shade the plants for a few days, until they get well started. For this purpose boxes, boards, flower pots, newspapers, straw (cut or long), dock, cabbage or other large leaves, may be used. Watering the plants should not be neglected if the soil is dry. If "pot-grown plants" are used, they should always be watered well when dry, either before or after planting. Frequent cultivation is especially appreciated by summer planted strawberries, and causes them to grow with great vigor.

FALL PLANTING.—This is often practiced in the months of September, October and November, or until the ground becomes frozen. Even in December, I have sent many thousands of plants to the southern States. The same methods are to be employed in preparing the ground, and in planting, as at other seasons. When planting in November, in freezing weather, I have usually met with the best success when the plants were covered the same day with an inch or two of soil. The other mulching materials may also be used in giving winter protection.

TO DESTROY STRAWBERRY WORMS.—These feed upon the leaves in some sections of the country, causing them to shrivel or curl, and to dry up. They are easily destroyed, when they appear, by sprinkling the plants, after the fruiting season, with a solution of Paris green (a poison) once a week for three or four weeks. The solution is made of one or two teaspoonfuls of the dry Paris green to two or three gallons of water. It may also be mixed with flour and dusted over the plants when wet with rain or dew. Another plan is to burn dry straw over the plants, scattering it just thick enough to burn the leaves, but not the crowns.

YIELD AND PROFITS.—Upon selecting the best or most suitable varieties, depends much of the success of fruit growing. A hundred bushels, or a thousand quarts of large berries like the Monarch, Sharpless or Boyden, sometimes bring as much as three times that quantity of commoner or inferior berries, besides the saving in cost of picking

baskets, freight charge and commission. From two hundred to four hundred bushels of berries are sometimes obtained from an acre, though a more common yield is from fifty to one hundred bushels. The total cost of plants, cultivation, picking, etc., etc., is usually from $75 to $100 per acre. It would only require about twenty bushels of nice berries at fifteen cents a quart, or thirty bushels at ten cents a quart, to pay the expenses, leaving the rest for profit. To obtain an extra yield of fruit, an extra sum is sometimes expended, but giving an increased profit.

In the way of profits, I can mention a case in which $110 worth of Jucunda berries were sold from one-eighth of an acre. Of another in which the crop of Boydens was sold at the rate of over $1,500 per acre. Two ladies in Centralia, Illinois, are said to have raised and sold nearly $850 worth of berries from an acre and a quarter of land. A gentleman in this State succeeded in getting one hundred and fifty bushels of berries from half an acre, selling them for $500. These instances *are the exceptions* and not the average, but they show what are the capabilities of the strawberry when good and suitable varieties are selected, and everything is favorable.

TO HASTEN THE TIME OF RIPENING.—Early berries sometimes bring the best prices. If early varieties are planted on the south side of a thick hedge, or of a close fence or wall, it is possible to get fruit some days earlier than otherwise. The southern slopes of a hill, or of an artificial ridge made two or three feet high, are also favorable. If planted on northern slopes, or in thickly matted rows, or on clay soils, their time of ripening can be retarded. On light or sandy soils, if not too rich, they will ripen early, whether "in hills" or "matted rows." A few quarts of quite early berries may be obtained by placing a hot-bed frame and glass over some early varieties in the garden. This should be done very early in spring, or at the close of winter, if tried. Keep well covered with old carpets, straw or matting when the nights are cold. Give air on warm days. Even without the glass, by covering the frame at night, early berries may be obtained.

TO INCREASE THE YIELD AND FRUITFULNESS.—It is said that if strawberry plants are sprinkled every night, while blossoming, with a solution made of one-quarter of a pound each of ammonia and common nitre (probably crystals) dissolved or mixed in two barrels of rain water, that the size and quantity of fruit will be greatly increased.

STRAWBERRIES AT THE SOUTH.—The Monarch of the West, Captain Jack, Wilsons and Charles Downing all do well in the Gulf States; also, Sharpless, Boyden No. 30, Kentucky, Duchesse, Crescent Seedling, Cumberland, Triumphe, etc., in many of the same States and in other localities at the south. Favorable reports from correspondents in those States are also reaching me of many of the newer varieties. Probably many of the other older varieties would also succeed, if planted in the partial shade of trees or fences. Strawberries at the *north* usually do best where fully exposed to the sun, but good crops can also be obtained in orchards where the shade is not too thick. Good drainage, either natural or artificial, is especially important at the south, to prevent the soil from baking too hard, and the plants from burning up.

RIPENING OR COLORING BERRIES.—Occasionally it is desired to color berries that, from some cause, have only partially colored. The simplest plan is to support the fruit stalks four inches above the ground by means of stout wire. The ends of the wire may be driven into the ground, while the rest of the wire may be bent to fit half around the plant and to support the fruit. Barrel hoops or other materials may also be used to raise the berries from the ground, and thus to give them sunlight.

RASPBERRIES.

UNDER the name of *Rubus* (*Framboisier*, of the French) may be found three distinct divisions into which all the different varieties of this fruit may be classed. Among the European varieties (*Rubus Idæus*) are found the Clarke, Brinckle's Orange, Franconia, &c. The plants of this class are of an upright habit of growth, with the bristles on the canes mostly straight and slender, and producing plants from sprouts coming up from the roots. The American red varieties (*Rubus strigosus*) are of very similar habits of growth, being also propagated from suckers, and having usually a larger supply of bristles on the canes. In this class are found the Philadelphia, Brandywine, Highland Hardy, &c. Some of the finest of the American varieties are so similar to the European as not to be easily distinguishable. In the class *Rubus occidentalis* are found the Gregg, Davidson's Thornless, and the rest of the black varieties. Yellow varieties, like the Caroline and Florence, that are propagated by the tips of the canes taking root in the soil, and some few red varieties, like the New Rochelle and Ganargua, having the same habit of propagation, are also closely allied to this class.

The Raspberry is one of our most popular fruits, and being very easily grown, is destined to be still more widely planted as the superior qualities of some of the newer sorts become more generally known. There are, perhaps, none of the smaller fruits that give a larger share of unalloyed enjoyment than does this. Besides the pleasure that the berries give in adding to the variety of our tables, either as picked and eaten when fresh and sparkling with drops of dew, or, as they come icy cold from the refrigerator or ice-house during the hot days of summer, they are also said to be especially beneficial to those who are suffering from rheumatism or gout, as they seem to be possessed of considerable medicinal properties. The mild acid of the fruit is not very liable to undergo fermentation in the stomach, and, consequently, proves an agreeable and healthful fruit to nearly all who use it in moderate quantities. In the form of raspberry vinegar or syrup, or in the making of preserves, tarts, ices, and jellies, the fruit proves, also, exceedingly welcome at other seasons of the year.

SOILS.—Though the raspberry can be grown on almost any soil, yet to grow the berries in their greatest perfection, it is well, when practicable, to select such soils as are best adapted to the plants. A rich, gravelly soil, or a good moist loam, are perhaps most generally acceptable to the raspberry. The plants also do well on sandy loams, especially if deep, and will ripen their fruit some days earlier on such soils. It is not advisable to plant the red varieties on hard clay lands, as only moderate crops can thus be obtained; nor should they be planted on low, wet soils that are under water in winter. The black varieties, or the *Rubus occidentalis* family, however, are more easily suited, and give good crops (but not the best) even on hard clay or wet soils.

PLANTING AT THE SOUTH.—Light, sandy loams should be avoided in planting this fruit in the extreme southern States, unless where there is a clay subsoil within two or three feet of the surface, to assist in retaining the moisture. Nearly all of the black caps, and many of the red and yellow varieties of the same family, do well even among the most distant of the Gulf States. Of the older red varieties the Turner (Southern Thornless) seems to withstand the hot summers of the south quite well, and to be generally acceptable. Herstine, Brandywine, and Cuthbert suceeed in many of the southern States, but Pride of the Hudson and Highland Hardy require a colder climate. Probably a number of the other newer red varieties would be found to succeed if given a trial.

GENERAL DIRECTIONS FOR PLANTING.—Though raspberries can be planted on new land or on sod land after the sod has been turned under, yet a plot that has previously been occupied by hoed crops or grain is more desirable and can be easier worked. In planting largely it is usual to run a plow eight or ten inches deep, and to scatter the manure along in the furrows. The roots of the plants should be kept damp while planting, keeping the greater number of the plants covered in a box, wagon, or wheelbarrow until needed. The soil can be quickly and easily pulled back into the furrows, in covering the roots, by using a hoe or running a small plow. When planting in limited quantities, then the manure can be spread broadcast before spading or plow-

ing the ground, retaining a portion of the fertilizer for placing above or below the roots of the plants. When using a spade make the holes sufficiently large to allow the roots to be spread out, and place the plants about as deep as they originally had been grown. Unless the soil is wet, it is always well to firm it a little with the foot before filling in the last inch or two of soil.

This "firming" of the soil should also be performed in setting out all other plants or trees, as it greatly assists in retaining the moisture in the soil. In March or April no shading is required for any of the hard-wooded plants, and indeed it is seldom needed except when planting late in the spring, when the plants are out in leaf.

After setting out raspberries or blackberries, it is best to cut off the canes within from two to six inches of the ground, as a much stronger growth for the next year's crop can be obtained in this way. A few scattering plants might be left a foot or two high if specimen berries are wanted, though the largest sized samples can seldom be obtained the first season. In fall planting this cutting back is not necessary, though I usually consider it to be beneficial.

MANURES AND FERTILIZERS.—Though old stable manure is, perhaps, the best for general use, yet there are quite a number of other fertilizers that can be used to good advantage. On clayey loams, or heavy soils, fresh stable manure will help to make the soil more friable and easier to cultivate. On light soils or sandy loams good barnyard manure is probably the best, as it is less heating than that from the stable. Decomposed sods and muck are both good for nearly all fruits, and especially if left exposed to the action of the frost in a barnyard during the winter. Leaf-mold or soil from the woods is also an excellent assistant. Bone-dust or ground bone, or guano or hen manure, at the rate of from 500 to 1,000 pounds to the acre, may be applied *broadcast*, and harrowed in, or placed on the surface before hoeing or cultivating. Wood ashes applied on the surface in spring or summer, and afterwards worked in, are excellent for all fruits. When stable manure is scarce or high priced, it is cheaper and easier to use some of these concentrated fertilizers instead, and even when manure is easily obtained. I think I would prefer to use a combination of manure, bone-dust and wood ashes, not mixing them, but applying them either at the same time, or at different times in the season just before hoeing or cultivating. Salt, applied *broadcast* at the rate of from one and a half to three bushels per acre, is beneficial. On very rich soils, or on good prairie soils, an application of ground bone and wood ashes will probably be all that will usually be required. Many of the patent fertilizers are good, but should always be spread broadcast, and used either sparingly or around only a few plants, until their properties are well understood. The pleasure that will be obtained in experimenting with them, will make up for any slight mishaps that may occur.

HINTS ON CULTIVATION.—By planting in rows, so as to permit of using horse-power in cultivation, it is possible usually to raise fruit at much less expense, as more work can be accomplished with a plow or cultivator in an hour or two, than a man would complete in two days. The oftener that newly set plants can be hoed or cultivated the first season, the stronger will be their growth, It is very important that a good start should be obtained, as a plant that is stunted in its growth the first season seldom becomes as vigorous as one that is liberally treated and well cultivated the first year. Good cultivation on some soils will almost take the place of manuring. Most fruit plants will give good crops if only hoed or cultivated once or twice in a season, but to have them grow to perfection, once every three or four weeks is none too often. When using a plow around young plants, the soil may first be plowed away from them, and immediately plowed back again. If in a garden, it may then be smoothed over with a rake or hoe.

In the course of a few weeks, when the weeds commence to grow, the soil may be again stirred with a cultivator or hoe, and afterwards hoed, cultivated, or plowed as often as desired. Frequently, small weeds can be easily smothered or destroyed by covering them with an inch or two of soil, and allowing it to remain for two or three weeks, or until the next hoeing. The ground should nearly always be kept as nearly level as possible, except where the soil is very wet, or where surface drainage is desired.

CULTIVATION AFTER THE FIRST SEASON.—In March or April, after the weeds commence to grow, the plow may be run between the rows, if the ground is suitable. Among raspberries, blackberries, and grape vines, it should be run quite shallow, as their roots usually extend nearer the surface of the ground. All weeds or refuse matter should then be carefully hoed out from among the plants, and either carried away or

scraped into the furrows made by the plow, to be afterwards smothered or covered with soil. The plants may then be hoed or cultivated at intervals until in blossom, when all cultivation should cease until after the fruit is picked. Currants and gooseberries may be cultivated all the second summer, as they do not usually come into bearing much until the second or third year after planting. As blackberries do not blossom until after raspberries, they can also be cultivated later. On this account it is better, when using horse-power in cultivation, to place these different fruits either in separate rows, or in parts of the same rows by themselves. However, when not convenient this need not be done, as it makes very little difference, especially after the second season.

SUMMER PRUNING.—The first season only two or three raspberry shoots or canes should be allowed to grow up from each hill; any others should be hoed down the same as weeds, where fruit is the object. In June, July and August, or as soon as the canes reach a height of from two to three feet, the tops should be pinched off or broken off with the thumb and finger. The more vigorous shoots may be allowed to grow to even three feet in height, if desired. If this summer pruning should be neglected the first year until the canes have grown quite tall, then it is probably best not to cut them back quite so far. A knife or shears will sometimes be required where there is much of a growth to be taken off.

This pinching off of the canes causes them to send out lateral shoots, so that nearly double the crop can be obtained by doing so. Where these lateral shoots have made a growth of a foot from the canes, they can be pinched off, causing them to put out new laterals. This second heading back may be deferred until early in spring, when desired. When treated in this way the plants become quite strong and stocky, and are enable to withstand ordinary winds, and to hold up their fruit without the assistance of stakes. After the first year raspberries need not be pinched off until the canes are from three to three and a half feet high. Some of the laterals, growing nearly upright, afterwards give a height to the plants of from four to five feet, which is high enough.

WINTER PRUNING.—South of Virginia, this may be performed at almost any time during the winter, but where the cold is severe, it is well to defer it until the winter has passed. All the old canes, or such as had fruit upon them, should be cut out at this pruning, as fruit is only produced on raspberry or blackberry canes of the previous years growth. With a pair of pruning shears and thick gloves, this part can be easily done; or a short briar hook on a long handle can be used.

Some persons make a practice of cutting out the old canes in July or August, immediately after the fruiting season, but I do not consider it to be advisable, as cutting away so much foliage is liable to check the growth of the young canes; while, if left, they are also quite a help in assisting the plants to withstand winter winds. In districts where half-hardy varieties require winter protection, the old canes can be cut out, and the others pruned in October or November, just previous to covering them. However, in gardens, where it is desired to keep the plants trim and neat, or where winter winds are not feared, then the old canes may be cut out at almost any time without serious injury to the plants.

In pruning the bearing canes in spring, the laterals should be cut back to within about a foot of the main stems, or when the tips are frozen, to a point back of where they have been winter killed. The frozen canes are usually of a different color from the rest of the wood. Frequently I have had my plants pruned as late as the middle of April, waiting three or four days after the buds have opened, and then pruning off the branches just beyond a strong bud. At this pruning any surplus canes may be cut out, if not hoed out the previous year when small.

In hill culture from three to five canes will usually give more and better fruit than if a larger number are allowed to grow. Even when grown in rows it is best to keep the rows quite narrow, not over a foot and a half or two feet wide near the ground; cutting off or hoeing down all canes coming up in the paths.

MULCHING RASPBERRIES.—In many portions of the south it is quite difficult to grow some of the red varieties, unless well mulched during the summer. Even at the north, upon very dry soils or in dry seasons, it is a great assistance in obtaining finer berries and larger crops. Any refuse material will answer, such as cut grass, marsh hay, straw, corn-stalks, sorghum, course manure, pine needles, leaf mold, leaves, &c. To be of any special benefit, the mulching should be applied at least two inches thick, and one foot wide on each side of the plants; while it is better, if possible, to have it twice as thick, and two or three feet wide. Plants that are well mulched require very little culti-

vation, sometimes none at all is given them, as the mulching smothers the weeds, and keeps the soil moist and friable underneath. Boards, or pieces of boards, placed along the rows, or a few large flat stones placed by the plants, sometimes assist greatly in keeping the soil moist underneath, and consequently assist in obtaining larger and finer berries.

The raspberry, however, is so easily grown in most parts of the country, that fine crops can nearly always be obtained without resorting to mulching. When practiced at the south, it should be applied in April or May, and kept on all summer, leaving three or four inches of space open around the plants during the early spring, until the new canes have come up from the roots. When planting in spring at the south, it is almost a necessity to keep the plants well mulched the first season, to enable them to survive their first long hot summer. In this State it may be applied in May or June, or even early in July, at which time the same mulching can be used that has been placed around the strawberries.

THE RASPBERRY RUST.—The Raspberry is affected by very few diseases, and of these the "rust" is about the only one of any importance. By using a little watchfulness and care, it can easily be stamped out, but if too long neglected, it will destroy entire plantations of raspberries and blackberries. The "rust" (*aregma bulbosum*) is a bright golden or orange red fungus (sometimes turning black), that forms on the under sides of the leaves, causing them to curl or shrivel up. The plants, when affected, soon lose their vigor, and become useless for fruiting.

The surest method to crush out the disease is to at once dig up all the plants affected, and burn both root and branch. If removed while the foliage is damp, the "rust" will be less likely to shake off and spread to other bushes. No other raspberry or blackberry plant should be planted in the same place until nearly a year has elapsed. A top-dressing of lime is said to hasten the purification of the ground.

Another method, that is said to be effectual, is to syringe the leaves and canes with lime-water, made of lime dissolved in water; or to apply dry-slacked lime to the under side of the leaves when wet. Salt scattered around the plants is also said to be a remedy; too much would probably kill the plants. Possibly, dissolved in water and applied to the leaves, it might benefit, if not too strong.

Still another method is to apply fresh wood ashes to the under side of the leaves, and to scatter it liberally on the ground. Draining the land is said to be an assistance, also a partial preventive.

Having had very little trouble with the rust, I can only mention these as experimental methods to be tried in the earliest stages of the disease. The cutting out process I know to be effectual. Where only a portion of a plant is affected by the rust, then it may prove effectual to cut out such branches, and try some of the above experiments for driving the disease out of the plant and from the soil.

STAKING RASPBERRIES.—Though stakes are not required if the "pinching-in" process is followed, yet, in garden culture, they are sometimes used by those who wish their plants to grow close together. One way, that is usually followed, is to drive a stake down in each hill, and tie the canes to it. Another method is to drive down two stakes, one on each side of a hill, and nail a barrel hoop to them, thus enclosing the canes. Another method is to drive down a stake every ten or twenty feet, and stretch one or two wires on them at a distance of from three to four feet from the ground. A fourth plan is to nail a wooden strip to the tops of stakes, at a height of three or four feet from the ground, with another strip lower down when desired.

Any of these plans can be followed with very little trouble and at slight cost; but when summer pruning is practiced, or when plants are grown in continuous rows, and cut off at from three to three and a half feet from the ground, the stakes are entirely unnecessary, and especially if the plants are well mulched, as the mulching will keep the fruit from coming into contact with the ground, and from becoming soiled.

WINTER PROTECTION.—South of Virginia, raspberries or blackberries do not require winter protection. Even here there are very few varieties that really need it, as a slight freezing of the tips or ends of the branches does no serious harm. In localities or gardens that are exposed to severe sweeping winds, or where the plants have not properly matured in the fall, there it is often necessary to cover varieties that are usually considered nearly hardy. However, quite hardy varieties often give enough finer fruit to pay for any little trouble that may be required in covering them. By experimenting

with two or three bushes of a kind, it can soon be ascertained, whether it is worth the while to cover the rest of the plants or not in succeeding winters. Sometimes it is entirely unnecessary to do so in some localities, even with what are called half hardy varieties. One method of protecting is to tie the canes to stakes, and to bind a little straw around them just before winter sets in. Another way is to bind the canes to the ground and to cover them with evergreen boughs, or salt hay, or with leaves, old tomato vines, &c., thick enough to shade them from the sun. Still another method is to bend the canes to the ground, and to cover the tops or the entire canes with from two to four inches of soil. This is the favorite way when winter protection is required, and is better than leaving refuse material around in the garden, as, if mice are prevalent, such litter affords them a very convenient shelter from which to make incursions upon any young fruit trees that may be near at hand.

By using a digging fork or weight (small boys will answer), to keep the canes in place, it is possible for a man to cover quite a plot in an hour or two.

When giving winter protection, the plants may be pruned in the fall instead of in the spring, as they will then require less covering. They should not be uncovered, in the spring, until all danger from cold winds is past, or until about the time that the buds commence to swell. Mulching the ground in winter is often practiced, even when the canes themselves are not covered.

YIELD AND PROFITS.—The raspberry is one of the most profitable of fruits to grow, and, when suitable kinds are selected, pays very handsomely. In the Boston, New York, and Philadelphia markets, good berries frequently sell at 25 cents a quart, at which times it is no unusual thing for a good sized one-horse load of berries to sell from $100 to $200. The average price of recent years, in New York city, has been from 10 to 15 cents a quart, or from $3 to $5 per bushel. Sometimes a little lower, and at other times considerably higher, for large or early berries.

The average yield of the red varieties is about 2,000 quarts per acre, or from 50 to 60 bushels. Black caps range in yield from 50 to 150 bushels to the acre. Some of the red varieties have been known to produce at the rate of two or three times these figures. The average profits are about $150 per acre; oftener the profits are about $100 per acre; but it is no unusual thing to have the fruit sell at from $200 to $400 per acre, and at times even higher figures are attained.

Seldom is a village or town to be found in which there is an over supply of this fruit, and as the raspberry is an annual bearer, and an easy fruit to grow, it proves one of the best in furnishing a steady income. Where space is limited they can be planted along the fences, thus requiring no stakes; or placed in tree rows, where a partial shade is often a benefit instead of an objection. A few plants scattered around in the garden, and yielding from ten to seventy-five cents worth of fruit per plant, will furnish spending money that will no doubt prove acceptable to either the young folks or their elders.

HOW TO MARKET RASPBERRIES.—The red varieties are usually sold in the New York city markets, in little baskets or wooden cups holding one-third of a quart. They are, also, often sold in pint baskets, but seldom in quart baskets, as they can be transported better, and be kept fresher, in small baskets in which the air can circulate freely. The black caps are sold either in pint or quart baskets. The new crates that I have been using of late years, owing to their better ventilation, are quite an improvement over the older styles formerly in use.

DIRECTIONS FOR OBTAINING A CROP IN THE FALL.—By selecting some autumnal bearing variety, like the Belle de Fontenay, it is possible to obtain a fine crop during the fall months. Raspberries, at this time of the year, are often sold at from 20 to 40 cents a quart in the larger markets, owing to their scarcity. The method to be followed is very simple, and consists merely in cutting off all the canes early in the spring, at from three to six inches out of the ground, and giving good cultivation or mulching during the spring and summer.

Only the strongest of the new shoots coming up should be left (from four to six canes to a hill), and on these a fine crop will be obtained in August, September, or October. A smaller crop can be obtained in July, also in the fall, by merely allowing the plants to grow naturally like other raspberries, thinning out the smaller canes when too thick.

FALL PLANTING OF RASPBERRIES.—As a plantation of red raspberries will remain in its prime for six or eight years, and will often continue to yield fair crops for fifteen or twenty years, it therefore pays to set them out with care at the commence-

ment. When the planting has been omitted in the spring, then it can be performed with good success in the fall.

The usual time for fall planting of raspberries, blackberries, currants, &c., is during the months of October and November, though at times I have had plantations made during the first weeks of December, even after the surface of the ground has been frozen fully an inch in depth. When planted in early fall, the roots keep growing, even though the tops remain dormant. At the south, the advantages to be gained by fall planting, are even greater than in this vicinity.

HOW TO PROTECT FALL SET PLANTS.—The simplest plan is to flatten the soil with a hoe just above, or at the side of, each plant, in order to show where they are planted, and then the first time that the ground freezes hard enough, to drive on with a wagon and throw a forkful of manure over each plant. Many persons consider it an advantage to first cut the raspberry or blackberry canes off close to the ground.

In the following spring a light harrow can then be driven over the field, mixing the manure with the soil, and at the same time destroying the weeds until the plants have made a good growth. When manure is not very plenty, then only a little, or none at all, need be placed around the plants, and the soil heaped up around the canes (which may be cut off or not) to the height of from six to ten inches.

Another method is to place manure around the plants, and after bending the canes to the ground, to cover them with from two to six inches of soil. I prefer covering with soil, or the "hilling up" method, either with or without manure; though the manure, dissolving in the soil and washing down around the roots, will usually give a splendid growth the next year. The first method, with manure alone, is equally as good for black caps, or when the canes are cut off close to the ground, and probably at the south for all plants set out in the fall; but, by following any of the above plans, a plant will seldom be lost, and a thrifty growth will be nearly always obtained.

BLACKBERRIES.

THE blackberry is grown throughout the length and breadth of this country. The fruit ripens here in July and August, succeeding most of the varieties of raspberries. Some of the finer kinds produce berries from an inch to an inch and a half long, and prove a great addition to the appearance of the fruit-dish. Their rich, pleasant flavor makes them a favorite with nearly every one, and especially when brought icy-cold from the refrigerator.

PLANTING AND CULTIVATION.—Being of a more vigorous growth than the raspberry, the rows or hills in which they are planted should be placed a foot or two further apart. Very little manure is needed by them after the first year, as they give better crops and prove more hardy when the ground is only moderately rich. Hoed crops may be planted between the rows the first year or two. The same suggestions, given under the head of raspberries, about "soils," "summer and spring pruning," "rust," hoeing off of suckers, and "fall planting," apply also to the blackberry, except that, in "summer pruning," the plants need not be "pinched in" quite so close.

HARDINESS AND WINTER PROTECTION.—Some varieties are sufficiently hardy to withstand the winters of New Hampshire and Canada without protection. Other varieties are made more hardy by summer pruning, or by omitting, after the second year, all cultivation after the time of blossoming; or, if cultivating after the time of fruiting, to cultivate at *regular* intervals every week or two. Cultivating only in the spring is the safer method, usually mowing down the weeds or scraping the ground with a hoe, when necessary. Later in the season, where it is desired to cover half-hardy varieties, the canes may be left unpruned during the summer, so as to obtain a more slender growth; or else the soil may be dug away from one side of the plants, and the canes more easily bent over and tops covered.

YIELD AND PROFITS.—Requiring but little manure, and being as easily grown as a field of corn, the blackberry proves one of the most profitable of fruits. The yield

per acre is usually from sixty to one hundred bushels, though, at times, one hundred and fifty bushels have been obtained. The price, in some markets, averages twenty cents per quart, and in others, twelve and fifteen cents. Some plantations yield fruit for from twenty to thirty years, giving an income of from $100 to $400 per acre. At times, $500 worth of fruit has been obtained per acre. Berries from the south have, sometimes, sold in the Philadelphia and New York markets as high as fifty cents per quart. Blackberries do well even in Florida, and in other of the Gulf States. At the north, forty plants have been known to yield fully eight bushels of fruit. They will give a nice little income to children when planted along fences, even if uncultivated after the first year. When grown in a grass-sod they often are very hardy, and quite productive.

MARKETING BLACKBERRIES.—The berries are usually sold in New York in square quart berry baskets, packed in 32-quart ventilated crates; seldom in pint baskets.

CURRANTS.

THE Currant (*Ribes rubrum*) has been grown in the gardens of Holland and England for fully a century, and has now become almost a necessary addition to every garden. It is one of the easiest of fruits to grow, giving crops even when entirely neglected, and yet few fruits repay rich culture so well, under favorable circumstances. Single globes of the Cherry and Versailles variety have measured an inch, and one and a quarter inches around, and those of the Black Naples even larger.

SOIL AND CULTIVATION.—The plants do well on nearly all soils, even on a heavy clay. If anything, they thrive even better on soils containing a mixture of clay. Especially is this the case further south, where they drop their foliage sometimes in early summer, when planted on light sandy soils. Summer mulching in such localities would probably prevent that. The richer the ground, the heavier will be the crop of berries; their size will also be increased, Mulching with any of the materials mentioned under the same head in raspberries, or with coal ashes, is excellent, if performed during the fruiting season.

PRUNING AND HARDINESS.—The vigor of the plants may be kept up for many years by cutting out all old canes that show signs of failing, and in annually cutting back or thinning out the young shoots one-third or one-half. This pruning may be done in October or November, or during the winter, or before growth commences in the spring, and will be found also to add greatly to the size of the fruit, and to the productiveness of the plants. Pruning, however, at the close of winter, I consider to be the most satisfactory time. The currant is considered "hardy," and does not require winter protection. Mulching the ground with coarse manure, and protecting with straw or evergreen, might prove a benefit in northern Minnesota, or in other extremely cold localities.

PROLONGING THE FRUITING SEASON.—The currant ripens in July and August, but, by shading the bushes after the middle of May, with matting or straw mats, the fruit may be kept even into September and October. On some soils, it may be well to keep the roots cool and moist by heavy mulching. A late variety, like the Victoria, answers the same purpose, though in a less degree. If plants are closely shaded, even after the first of July, the ripening of the fruit may yet be retarded. Another plan is to allow grape vines, or other trailing vines, to climb over the bushes.

DESTROYING THE CURRANT WORM.—The currant has very few enemies. Of these the most common is the currant worm (*abraxis ribearia*). This is easily and *commonly* destroyed by mixing a spoonful of powdered white hellebore (a poison) in a pailful of water, and sprinkling the bushes upon which the worms appear. Another method is to mix a spoonful of kerosene or coal oil with a gallon of strong soap-suds or water, and sprinkle it over the bushes with a whisk-broom.

Another plan for destroying the worms is to make a mixture of half a pailful of wood

ashes, and one pint each of powdered hellebore and flour of sulphur, and dust it lightly over the worms while the foliage is damp. It is said that dry wood ashes alone, or soot, will also destroy them. Another method, that is said to be successful, is to mix one ounce of crude carbolic acid in half a pailful of luke warm water, in which a little soft soap, or one-quarter of a pound of hard soap had been dissolved. Another remedy, consisting of one part of Paris green to ten of flour or plaster of Paris, should only be used on young plants, or after the fruiting season, owing to its extremely poisonous character.

Other methods consist in sprinkling the bushes frequently with skim milk, or occasionally with a strong brine made of salt and water. A solution made of common dried Indian pokeroot (hellebore) and water, will be the easiest and most effective in most hands. Due care should be taken not to apply the salt or carbolic acid mixtures too strong, or too frequently, and not to use any poisonous preparations when the fruit is large or ripening. Many fruit growers never have to employ any of these remedies, as all plantations are not affected.

The Currant Borer (*prenocerus supernatatus*) is less frequently found. It feeds upon the pith or wood of the young shoots; but, by cutting out in the winter and burning all shoots that are shriveled up, they can soon be headed off. Experiments made with some of the remedies mentioned above may, perhaps, be successful also. Plants grown in single stems, formed by cutting off all buds below ground from young plants, are more liable to be seriously injured by the borer. Currants and Gooseberries are sometimes grafted on the Missouri currant (*ribus aureum*), and grown as single canes or standards. They are then said to be proof against the borer; also in the case of foreign gooseberries from mildew.

YIELD AND PROFITS.—A yield of from two hundred to two hundred and fifty bushels of currants per acre has, at times, been obtained, but usually, one-third or one-half of that quantity would be a safer estimate. The price ranges from two dollars to five dollars per bushel, or from five to fifteen cents a pound, according to the varieties or markets. The largest sales that have been reported to me have been at the rate of $600 and $800 per acre. The usual figures are much less. The bushes generally commence bearing the second year after planting, and increase in yield as they grow larger.

MARKETING AND USES.—Currants are usually sold in bulk by the pound, and are nearly always shipped to the New York city markets in flat baskets or boxes holding from ten to thirty pounds. Peach baskets or flat market baskets with muslin covers are also often used. The uses to which the currant is put are so well known as to hardly make it necessary for me to mention them; but I will merely remark that, in the form of jelly for tarts, or as an accompaniment to mutton or venison, that it has few, if any, equals.

GOOSEBERRIES.

THE Gooseberry (*Ribes Grossularia*), when given proper care, will prove both popular and profitable The fruit in a green state is often in great demand in the markets, and is used in quite large quantities for making up into tarts, pies, preserves, etc. When ripe, and eaten fresh from the ice-box, the berries prove very tempting and delicious. The use of thick gloves, in picking, prevents any injury to the hands from the thorns.

SOILS AND PLANTING.—The gooseberry requires about the same treatment as the currant, and the same suggestions as to planting, cultivation, mulching, pruning, currant worms, manuring and hardiness will equally well apply to it. A rich moist (not wet) loam is probably the best soil for it, if a selection can be made.

PREVENTION OF MILDEW.—The American varieties, like the Downing, Smith's Improved and Houghton, are seldom affected, and in many gardens are entirely free from the attacks of mildew. When it is feared, it is well to set out the

bushes where they will be shaded during the heat of the day. Liberal manuring each fall or spring, and careful pruning, so as to keep the branches six inches apart, is usually effective. Artificial shade, or the training of running beans or vines over the plants, is often an effectual preventive. In gardens where the mildew appears, the crop can sometimes be saved by sprinkling the bushes with weak lime water, and at the same time scattering sulphur, lime and salt upon the ground, underneath the branches, giving a pint of the mixture to about every three large bushes.

Heavy mulching, if the ground is well underdrained, is often a benefit to the gooseberry, increasing the size of the fruit, and preventing it from falling off. Coal ashes, applied two inches thick as a mulch, is an easy way of accomplishing the same ends. Liquid manure, poured frequently around the roots, assists in increasing the size of this, as well as that of other berries. The north side of fences, or of buildings, is often a good location for the bushes, affording shade, and giving later berries.

PROFITS AND MARKETING.—The gooseberry is usually sold while green, and in bulk. The fruit ranges in prices at from $1 to $4 a bushel, and as the plants are generally very productive, proves quite a profitable crop. Sometimes the berries, either when green or ripe, are sold in quart berry baskets, packed in 32-quart crates. The fruit is freed from leaves at times by running it through a fanning mill.

GRAPES.

THE grape (*vitis vinifera*) has been grown for at least three or four thousand years; and man in the past, as at present, has rejoiced in being able to "live under his own vines," and to partake of its rich fruits. In nearly all parts of the world it can be grown with ease, and is used in immense quantities, either while fresh or in the dried form as raisins. It is one of the most nutritious of fruits for those in health, while physicians frequently prescribe it to the invalid.

SOILS AND PLANTING.—Almost any soil is suitable, if not too wet; warm, deep soils are usually preferred. The vines can be planted at the same time as other fruits, and should be placed in the ground about as deep as they originally grew. Planting in large holes, allowing the roots to be spread out, and with pieces of bones scattered about, will give the best results. Manures or fertilizers should not be placed in contact with the roots, but may either be spaded in previous to planting, or applied just above the roots before filling in all the soil.

CULTIVATION AND TRAINING.—Frequent cultivation is a benefit, as with all other fruits, but need not be so deep for the grape. The first year allow only one cane to grow, training it to a stake, or not, as preferred. In the fall, either prune or not, and if north of Virginia cover with a little soil, or with evergreen boughs, or other coarse material. The second year, in the spring, cut back to three or four buds, or to within two feet of the ground. If covered the previous winter, then it is well not to remove the protection too early. Most persons prefer not to give covering, merely laying the vines down upon the ground, even when quite far north. This second season two shoots only should be allowed to grow, rubbing off all extra buds.

The third season, having pruned these two canes off about four feet from the main stem, fasten them horizontally along the lower railing or wire of a trellis. Leave one shoot to grow upright about every foot, rubbing off the rest. Each fall or spring trim out all laterals, leaving only the two horizontal arms, and the eight or ten uprights. Two years later, and every year thereafter, every second or third upright cane may be cut back to within one bud of the main arms, and thus new wood for fruiting be constantly maintained. Another plan is to allow the canes to grow fan-shaped upon the trellis, renewing some of the canes occasionally by cutting them back. Still another method is to allow three or four upright canes to grow to a stake, cutting one or more of the canes back, near the ground, occasionally, so as to renew the wood.

SUMMER PRUNING AND TREATMENT.—The uprights may be pinched back at the tops of the stakes or trellises, which are usually made about five feet high.

Grapevines make an excellent shade over walks or side doors, in which case the uprights may be allowed to grow more freely. Young shoots from the roots or below the arms should also be removed, unless wanted to renew the main arms. After the fruit has formed, a few of the bunches may be cut out, if too thick or too many for the size of the vine. Thinning out a third or a half of the berries in a cluster—using small, pointed scissors—is often a benefit, making larger berries and finer clusters. Little lateral branches may be pinched back two joints beyond the first, or when too thick remove the smaller ones entirely. This summer care of grape vines is one of the pleasantest occupations for ladies, or other persons, who cannot readily perform the heavier duties of the garden, and many an enjoyable and healthful hour may thus be passed "out in the open air."

REMEDIES FOR MILDEW.—In some localities it sometimes happens that grape vines are troubled with mildew; but it is not much to be feared by most persons. The usual remedy is to dust the vines, when damp, with powdered sulphur, once every week or two until the fruit commences to color. Another remedy is said to be a solution of sulphate of copper (*blue stone or vitriol*) sprinkled over the vines just before the starting of the buds. Another plan is to wash the canes with carbolic acid soap, or a solution of sulphuret of lime, before the buds start.

The "grape rot" may also be prevented by pinning thin brown paper bags around the bunches, about ten days after the fruit has formed. An equally effective method, and one that keeps the color of the grapes better, is to pin thick, *crossbarred* mosquito netting around the clusters, when small, keeping these on also until the close of the season. A board covering, 20 or 24 inches wide, has also proved very effectual. Vines supported on brush, and running close to the ground, are said to be safe from the "rot" or other injuries. To drive off insects or the "grape curculio," it is recommended to wet the vines well (when the fruit is forming), with a mixture of one-quarter pint of kerosene stirred into a pail of water; or to smoke or "smudge" the young clusters by burning gas tar and rags, holding them on the windward side of the vines.

YIELD AND PROFITS.—As grape vines do not require usually much manure, the chief expense in connection with a vineyard is the care of the vines and picking the fruit. The yield sometimes reaches four tons of grapes to the acre, but it is better in the end, for the vines, to limit it to about two tons. The cost of cultivation, training and *picking* is usually from $75 to $100 per acre. The sales per acre range from $125 to $600—the fruit selling at from three to twenty cents a pound, according to the variety, or season, or state of the market.

MARKETING GRAPES.—In the New York city markets much of the fruit is sold in round or square paper or wooden boxes, holding two, three and five pounds each. Immense quantities are also sold in flat boxes or baskets holding from twenty to twenty-five pounds each. Open baskets holding six or eight pounds each, and fitting in the ordinary strawberry crates, are also frequently used.

GRAPES IN WINTER.—With a little care, this delicious and healthful fruit may be had upon the table during most of the months of the year. The Diana and Isabella are usually the kinds selected for late keeping. Catawba, Wilder, Rebecca, Iona, Clinton, &c., are also good keeping varieties. By carefully picking any of these (not too early in the season) when ripe and dry, and by placing them in a cool (not damp) room, they can usually be kept from two to four months. By placing them in cool rooms, in shallow covered boxes or drawers between layers of wheat chaff, cut rye straw, baked maple wood or bass-wood saw-dust, or between layers of paper or cotton, they can be kept sometimes for six or eight months.

Another plan is to cut the bunches with portions of the vine attached, and to hang the bunches up, first applying sealing wax to the ends of the branches. Still another method is to suspend them in the same way, sealing one end of the piece of vine, and keeping the other end in a bottle of water and powdered charcoal Sometimes the end of the vine is passed through a cork, and closely sealed in with wax. Grapes can also be often kept well in the small three or five pound boxes, in which they are sold, or when suspended in shallow market baskets, in a cool room of even temperature. Dipping the stems of the bunches in sealing wax is a benefit, whatever way the grapes may be packed away. Cellars are sometimes too moist, but at other times when dry and cool are excellent for keeping the grapes in. Bruised grapes should be cut out with scissors before putting away. The little care required in some of these methods will soon be forgotten in the pleasure of having *fresh grapes to eat for ten months of the year.*

GRAFTING, RIPENING LATE VARIETIES, &c.—The grape is usually grafted below the ground. Sometimes success is more certain in the fall, than when grafting in early spring. In fall grafting a reversed flower-pot, or small box should be placed over the cion, and the frost kept out by covering thickly with soil leaves, straw, &c. "Bleeding" of vines from spring pruning does little injury; grafting wax is sometimes applied to the larger branches when cut off. Prune grape vines if possible when the sap is dormant, though light spring pruning is practised at times even as late as in May. Old, unfruitful vines will usually send out new shoots, if cut back in March, within a foot or two of the ground. The time of ripening of late varieties, like the Catawba or Isabella, may often be hastened a week or ten days by cutting off one-third or one-half of the clusters, when small.

FRUIT TREES.

BESIDES the advantages of having a supply of fruit, there are many other benefits to be obtained from the planting of fruit trees. How much more attractive and homelike is the place, in which the agreeable shade of trees is combined with many a luscious feast of apples, peaches and pears! What tender memories of "home" cling around some old apple tree, under whose shade in youth many a happy hour had been spent! The "old oaken bucket" calls up many pleasant thoughts of years gone by; but how much pleasanter those thoughts of home life, when the cool shade of trees added to its attractiveness.

Many a parent has wondered why "the boys leave the farm." Would not many less have to ask themselves this question, if the surroundings of the house were made more inviting through the planting of apple or cherry trees, and the young people led to interest themselves in the smaller fruits? Then, as a permanent investment, can any better way be found for the use of a few dollars than in planting some fruit trees? It is often estimated that an apple orchard in full bearing, of an acre in extent, adds from $500 to $1,000 to the value of a homestead, and yet the original cost of buying the trees, and of transportation and planting is often less than $10 an acre. Small city lots or gardens are often benefited in even a greater degree by planting a good assortment of fruits.

PREPARATION OF SOIL, PLANTING, &c.—When possible, it is best to select ground where a hoed crop has been grown for a year or two previous; or, grain crops often leave the land in sufficiently good condition. Grass lands may be used, if the sod is turned under, six or eight months previously, in time to rot. When necessary, trees may be planted in sod land, being careful to have good fine soil in among the roots. If the sods, after planting, are reversed, and the ground covered with a thick mulch, they will usually quickly rot. Low wet lands should not be selected for planting, unless first under-drained or surface-drained.

Soils that are rich or rich prairie soils require very little if any manure; an occasional application of bone-dust, wood ashes, muck or chip dirt being better than stable manure. On most other soils, if crops are grown between the rows of trees, the young trees will be sufficiently enriched by what is given to the growing crops. Fruit trees are usually planted in the spring from March 15th to early in May, aud in the fall from about October 1st, until as late in the season as the ground is suitable. In planting, it is well to make the holes quite large, so as to have good loose soil for the roots to grow in. As trees grow from twenty to one hundred years, they are well worth careful planting. A few broken pieces of bones, scattered around in the holes, and covered with soil, are excellent to have underneath the trees.

In digging the holes for planting, the good surface soil should be kept separate from the poorer subsoil, and afterwards well worked in, among and around the roots. The trees should be planted about as deep as they originally grew in the nursery rows. In planting dwarf pears, many persons prefer to plant them from two to four inches deeper, as a larger growth is thus obtained. Before planting, it is well to cut off the broken ends of the roots, cutting from the underside. At the same time, or immediately after planting, the trees should be pruned, cutting out all except from three to five of the main branches, and shortening

these in from one-third to one-half of the previous years' growth. A much quicker and stronger growth may be obtained the first season, when they have thus been well cut back. In fall planting, it is usually best to defer pruning until early the following spring.

CULTIVATION OF FRUIT TREES.—Frequent cultivation adds much to the growth of young orchards. It has been estimated that one plowing and five harrowings in a season, costing about $5 per acre, are equal to ten or fifteen loads of manure costing $15 or $20. Orchards should not be seeded down to grass, except in cases of apple and cherry trees after they come into bearing, or when it is done to check the growth of other trees, and to promote fruitfulness after a too vigorous growth. However, good crops of plums and pears are often obtained when bearing trees are grown in grass, if a good top-dressing of manure or fertilizers is given them each year.

MULCHING AROUND TREES.—The same materials may be used as in the case of strawberries and raspberries. A loose cultivated soil is often a sufficient mulching in itself, but in seasons of drouth, or on dry soils, it is safer to cover the ground with some course material for two or three feet on each side of the trees. Mulching is a great benefit to young trees at the south; also, to trees at the north that have been set out late in the spring. Cherry trees should nearly always be mulched the first year.

DISTANCES FOR PLANTING TREES AND PLANTS.—The number of trees or plants required, can be obtained by multiplying the number to be contained in one row by the number of rows. Another method is to divide the number of square feet in the plot, by the number of square feet to be given to each plant or tree. Thus strawberries, planted three feet by one, occupy three square feet of ground each; and an acre, containing 43,560 square feet, divided by three, gives 14,520 as the number of plants required.

Strawberries,	2	or	3	feet by	½	to	1½	Apples,	20 to 40	feet by	30 or 40
Strawberries,	4	or	5	"	1	or	1½	Apples, (dwarf),	6 to 10	"	6 or 8
Raspberries,	3½	or	4	"	3½	or	4	Pears (standard),	18 or 20	"	16 to 20
Raspberries,	6	or	7	"	2	or	3	Pears (dwarf),	8 or 10	"	8 or 10
Blackberries,	5	or	6	"	5	or	6	Plums,	14 to 18	"	14 to 18
Blackberries,	7	or	8	"	2	or	3	Peaches,	14 to 18	"	14 to 18
Currants,	3½	or	4	"	4	or	5	Cherries,	16 to 20	"	16 to 20
Gooseberries,	3½	or	4	"	4	or	5	Quinces,	8 to 14	"	10 to 14
Grapes (stakes),	6	or	8	"	6	or	8	Apricots,	14 to 18	"	14 to 18
Grapes (trellis),	8	to	16	"	10	to	16	Nectarines,	14 to 18	"	14 to 18
Asparagus,	2	or	3	"	1	or	1½	Rhubarb,	3 or 4	"	2 or 3

NUMBER OF TREES OR PLANTS ON AN ACRE.

40	feet	by	30	feet	=	36	8	feet	by	8 feet	= 680
30	"		30	"	=	50	8	"		3 "	= 1815
20	"		20	"	=	110	7	"		3 "	= 2074
20	"		15	"	=	145	7	"		2 "	= 3111
18	"		18	"	=	135	6	"		5 "	= 1452
16	"		16	"	=	170	5	"		1 "	= 8712
14	"		14	"	=	222	4	"		4 "	= 2722
12	"		12	"	=	300	3	"		1½ "	= 13403
10	"		10	"	=	435	2	"		1½ "	= 17624

PLANS FOR ORCHARDS OR FRUIT GARDENS.—An excellent plan for laying out orchards, is to place the apple trees 35 or 40 feet apart each way, then in the apple rows, half way between, plant a standard pear. Then cross-ways, half way between the apple, plant a peach or dwarf growing tree. Opposite the pear trees, either a cherry, quince, plum, pear, or peach tree may be planted. The trees will then be either 17½ or 20 feet apart. If small fruits are also to be grown, then a row of raspberries or blackberries can be planted in each tree row, and three or four rows of strawberries in each space. If preferred, one space might be given up to raspberries, another to blackberries, another to strawberries, and another to currants and gooseberries; or the last two fruits, being longer lived, might be placed in the apple rows. By the time that the apple will require most of the ground, the peach trees and dwarf trees, and also the small fruits will be through bearing, while the pear and cherry trees, being of upright growth, will seldom interfere.

Another plan is to have a row planted with peaches, pears or plums, or dwarf trees, half way between each apple row, and small fruits or vegetables in the spaces between. In this way double crops may be obtained, giving an annual income of from $200 to $600 until the apple trees come into bearing; while the peaches, raspberries and blackberries will be benefited by the protection afforded by the apple trees. In places exposed to severe winds, it is sometimes advisable to plant a row of rapid-growing evergreens (pine or spruce, &c.) on the north and west sides, having the trees from 5 to 15 feet apart.

In small gardens in the suburbs of towns or cities, quite a number of trees may be planted, by setting out a row a few feet from the fence, having the row run all around the plot. By planting from 8 to 12 feet apart they will do well, and can afterwards be thinned out if necessary. When, in small gardens, a vacant space is wanted for vegetables, then only dwarf-growing trees, or peaches, plums, pears, &c., should be planted on the south side. Berry bushes may be set out next to the fences, and in the tree rows.

MAPPING ORCHARDS AND LABELING TREES.—It is always best to have a small map, giving the relative positions and names of the trees. This should be made either at the time of planting, or within a week, before the labels are lost. The wires on trees and plants are, happily for the orchards, quite frail; otherwise many a branch would soon be badly girdled. Copper wire will last some years, but, if used, the wire should be put on, leaving very large loops, and the wire should be examined every two or three years. Printed labels, or labels written with a lead pencil upon fresh paint, will last from two to ten years; but more durable labels are made by writing on zinc with a common lead pencil. The best form to use are triangular pieces, five inches long, and three-fourths of an inch wide at one end, and tapering to a point at the other. They are easily cut out of sheets of zinc. The smaller end may be curled around a branch, and will expand as the tree grows. Tin scraps, fastened on in the same way are also quite durable, and should be written upon with an awl or nail. The pleasure of growing fruits is greatly increased if the names are known, while the fruit itself often sells better when properly named. Trees and plants are well worth labeling.

RESUSCITATING TREES AND PLANTS.—If trees or plants have become very dry or shriveled from long exposure, or delays, then either bury them entirely in damp soil for two or three days, or place them in water for from 12 to 24 hours. If received in a frozen state, no injury will be experienced if placed unopened in a cellar, or elsewhere where they will be exposed to neither cold nor heat, but allowed to thaw out gradually.

"HEELING IN" TREES AND PLANTS.—Sometimes packages may arrive before the ground is ready, on account of heavy rains, or delay in plowing, &c. At such times it is often the practice to "heel in" the trees, &c. This is done by digging a trench 12 to 18 inches deep, and placing the roots of the trees in it, with tops reclining at an angle of 45 degrees. Cover the roots with soil, and, in the new trench thus formed, place another layer of trees, and so on, until all are "heeled in." If trenching them in, in the fall, to remain all winter, the soil should be well filled in among the roots, and banked up higher over them.

STAKING TREES.—This is seldom necessary, except at times in very exposed places. The "firming" of the ground with the foot before filling in quite all the soil, usually suffices to keep them from swaying in the wind too much. When staking is necessary, the trees should be tied, if possible, with some soft material, and a small roll of straw or matting fastened between the stake aad tree to prevent any injury. In fall planting stakes are rarely needed, as the "hilling up" of the soil usually keeps them sufficiently steady. Crooked trees, when young, may often be easily straightened by tying them firmly to stout stakes.

SUMMER PRUNING OF FRUIT TREES.—In young orchards I consider the summer to be the best time of the year for training trees into shape. In the spring, at time of planting, we will suppose that all except from three to five branches have been pruned out, and that these have been shortened in one-third or one-half. In May and June the main flow of the sap may be directed into one or two shoots on each branch, by pinching off the ends of all the other shoots when two or three inches long. In pruning it is well to remember that the way that a bud or shoot points, in that way the branch will grow. I consider it better to *pinch off*, or break off the shoots at distances desired, than to use a knife or shears in summer pruning of young shoots. Later in the summer

the young shoots need not be pinched off quite so close. This summer training of fruit trees will afford many a pleasant hour's recreation in the fruit garden to ladies, as well as to others. Trees that are well attended to in summer require very little pruning the following fall or spring; merely to have the terminal shoots *cut* back about one-third, and then only for the first two or three years. After that summer pruning is sufficient.

FALL AND SPRING PRUNING.—Trees may be pruned in October or November after the leaves have fallen, if summer pruning has been neglected. However, I consider it much better to wait until the close of winter, or in spring before the buds start or open. Even after they have opened, large or small branches may be cut out, but no pruning should be performed on the terminal shoots as late as that. If sawing off limbs over an inch in diameter, it is well to smooth over the cut with a sharp knife, and cover with shellac varnish, liquid grafting wax, or boiled linseed oil. Large or rotten limbs on old trees may be cut out at almost any time of the year, though best when not in leaf. If first cut a little on the under side with a hatchet or saw, a cleaner cut can be made If the owner of an orchard cannot be present all the time, then with a piece of chalk fastened to a long stick, he can mark the exact places to be cut by his men.

TO PROMOTE FRUITFULNESS IN TREES.—The pinching in of side shoots is one of the best ways of causing fruit buds to form. Another method is to fasten a ligature tightly around some of the branches. Another plan is to bend the branches, keeping the tops fastened down with weights lower than the bases of the branches. Another way is to make a circle of a branch, fastening in that way for a while. By partially breaking, or twisting young shoots, the sap may also be retarded so as to form fruit buds.

If many trees are to be treated, then the more common way is to cease cultivation, and to sow the ground with clover or grass seed, allowing it to remain in sod for two or three years. Any of the above plans will cause the trees or branches treated to produce fruit while younger than they otherwise would, if fruit buds or spurs had previously been absent. *Pruning the roots* in the fall or winter by digging a trench half way around or entirely round the tree, is an excellent way for treating entire trees or orchards. The trench may be made from three to six feet out, according to the size of the tree, and leaf-mould, rich soil or some compost may be thrown in before filling it up. One pruning of the roots is usually sufficient, though in succeeding years it may also be performed if desired. A top-dressing of two bushels of salt per acre every year or two, or of lime, often seems to have a good effect in promoting fruitfulness, though less speedy and less certain.

PROTECTION AGAINST RABBITS.—In some localities rabbits and mice sometimes "girdle" or eat the bark off of young fruit trees; large trees are not so tempting. Hunting dogs and shot-guns are a partial remedy for the rabbits. Poisoning with arsenic and sweet apples or sweet potatoes is sometimes practiced, but the pieces of apples should only be placed around the grounds near evening, and carefully gathered up each morning. A mixture of soot, lime and sulphur, made into a thin paste and spread on the bark of the trees late in the fall proves an excellent remedy against rabbits. Tarred paper wrapped around the trunks of the trees in November, with the tar side out, is effectual.

Other methods are to drive down a number of stakes close around the tree, or to fasten strips or *coarse* bark around the trees with strong cord or wire. Cow manure and lime, brushed on the trees two or three times a winter, will answer if applied pretty thick. An easy plan is to mix powdered sulphur with sweet milk, about as thick as paint, and apply it late in the fall. Cylinders of tin, made three feet high, are effectual. Painting with fresh pine tar is sometimes recommended, though safer if applied to paper first. Other plans are to rub the bark of the trees with fresh blood or livers, two or three times in the winter. Another way, sometimes practiced, is to mix sulphur moderately thick with melted refuse lard, and add two tablespoonfuls of kerosene to each quart of the mixture. One application will sometimes last two years. A mixture of fresh lime, flour and soft soap, in equal parts, slaking the lime in water first, is sometimes used. Others protect their trees from rabbits by covering the trunks with hay or straw.

PROTECTING TREES FROM MICE.—Hilling up the soil in the fall, or heaping up coal ashes around the trees, eight or twelve inches, or packing the snow hard around the trees, are usually effective where the mice are not very thick. Pieces of old

tin, obtained by melting the solder from fruit cans, or from old pails, or stove pipe, if wrapped around the trees, are the safest. If pushed down into the soil an inch or two, they will often exclude the borer also. When mice are very thick, it is sometimes necessary to poison them by soaking shelled corn in strychnine and water, and placing it around the orchard in fruit cans laid on their sides. These poisons that I mention should be used with *great caution*, if used at all, as they are equally destructive to fowls or any animals swallowing them. Some of the remedies used against rabbits, such as using tarred paper, or painting the bark with disagreeable mixtures, would perhaps also prove effectual against the mice, if tried.

FALL PLANTING OF FRUIT TREES.—Fall is the favorite time with many for making plantations of trees, as equally good success may be obtained as in spring planting. Peach trees planted north of Albany, N. Y., may not do quite as well as when planted in the spring, though good success is usually obtained. Cherries, plums, &c., sometimes do even better than if planted in April or May. The time in the fall is from early in October until as late as holes can be dug in the ground. After planting, place some rotted manure around each tree, and before winter sets in, have the soil well hilled up around them. This can be done as easily as hilling up the same number of hills of potatoes. At the south the "hilling up" may be omitted.

DESTROYING THE BARK LOUSE.—This is a small, scale-like, whitish, oval-shaped insect, about an eighth of an inch long, that is sometimes found on young fruit trees. A wash made by boiling tobacco stems in water, and mixing with soft soap, will easily destroy them. A solution of soft soap, or potash, or wood ashes, is also effective.

DESTROYING THE WOOLLY APHIS.—This is a minute, white, downy insect, that forms in the branches, appearing like mildew. It is sometimes called the "American blight," but is much more easily controlled than the regular blight. A wash of whale-oil soap speedily destroys it. Fresh white wash, made of unslaked lime and one-fourth sulphur, is another remedy. Sometimes half an ounce of carbolic acid is added. These washes are also good for destroying other forms of insect life. A wash made with half an ounce of common sulphuric acid and one-third of a pint of water, applied with a brush or swab, is also effectual, as are also many other lime or potash or sulphur solutions

APPLES.

THE APPLE (*Pyrus Malus, L.*, or *Apfel* of the German) is widely grown in this and other lands. So extensively is it grown, and so generally is it used throughout the year, that to us in America it seems almost a necessity; and no doubt its pleasant acid has added health to vast numbers of our countrymen. As suggestions have already been made about planting, cultivating, &c., under the head of "Fruit Trees," it will necessarily follow that a good many of my following remarks will be in regard to the treatment of diseases in trees, or of insects upon them. However, let no one suppose from this, that it is difficult to grow orchards of trees, as most persons are so little troubled with such things as to never resort to any of the remedies or method of treatment that I name. Indeed, I could mention a number of cases, in which good crops have been obtained for fifteen or twenty years, without resorting to any of these outside helps. Still, there are many persons growing fruit for profit, or for exhibition purposes, who will find them a decided assistance in accomplishing their ends.

CHANGING THE BEARING YEAR.—Some varieties of apples, and of other fruit trees also, yield such heavy crops one year as to require the following season to recruit in before producing another crop. When it is found that certain trees only produce fruit every other year, or during the "apple year," when fruit is plenty and low-priced, then this habit of bearing may be changed by picking off nearly all the fruit in May or early in June in the year when the trees first promise good crops. The trees may thus be made to bear their heaviest crops on the "off years," or when the prices are better. If an annual crop is wanted, then the young fruit should be

thinned out, if the trees are liable to overbear, and wood ashes, salt, and oyster shell lime, be applied to the soil above their roots each spring or fall.

THE APPLE BORER is the larva of a striped brown and white beetle (*saperda bivittata*) that bores into the trunks of trees at the surface of the ground. When this white grub is already present in the tree, it may either be picked out with a knife, or punched to death in its hole by using a twig or flexible wire. If the borers are not very numerous and time precious, then this may be omitted, but late in June the trunks of the trees should be washed down *to the ground* with a mixture made of half a gallon of soft soap, and quarter of a pint of crude carbolic acid, stirred into two gallons of warm water, and afterwards two gallons of cold water, added. Another easy plan is to mix an ounce of crude carbolic acid with a gallon of hot and strong soap suds, and apply when cold in June, and again the last of July.

Other preventives are to wash the lower trunks of trees with a solution of half a pound of common potash to half a gallon of water in May and June. Coal ashes mixed with wood ashes, and heaped up around the trees in May, are excellent. Wood ashes if applied alone very thick might injure *young* trees. Air-slaked lime and soil are also good to heap up around the trees. If the trees are entirely girdled by borers, mice or rabbits, they can often be saved by connecting a number of cions or grafts with the lower and upper bark in spring, and afterwards covering, where they join, with grafting wax.

DESTROYING THE CODLING MOTH.—This moth (*carpocapsa pomonella*) lays the eggs in the fruit that produces the *apple worm*. It is of a grayish color, marked with brown, and is about half an inch in length. One plan is to wind a band of hay or cotton flannel around the trunk or branches of the tree, and after the worms have come down from the fruit, and spun their nests in the band, it may be destroyed or cleaned before they hatch out. By placing old cloths in the crotches of the trees many may be caught. Swine and poultry will also destroy many apple worms if given a chance.

The moths, as well as other moths or beetles that fly at night, may be destroyed *in large quantities* by means of petroleum torches or small fires lighted in the orchards in May and early in June. A light thrown upon a fish or trout pond will cause many moths to fall into the water and be eaten up. Another plan is to place a lantern or lamp inside of a tarred barrel or against tarred boards. Another, to place a bell-glass smeared outside with oil over a light in a dish filled with oil. Wide-mouthed bottles half filled with vinegar, molasses and water will trap large quantities. United efforts in a neighborhood are best, and will soon give smooth clean apples and good crops for all.

THE CANKER WORM (*anisopteryx pometaria*) feeds on the leaves of trees. The female wingless parent moth commences to ascend the tree in March, laying a number of eggs, from which about the middle of May the brownish yellow striped canker worms are hatched out. The female parent moth may be prevented from climbing the tree by nailing a rope around the trunk, and afterwards nailing a strip of tin, five inches wide on the rope, or nail strips of tin around the trunk with the lower edge out. Other plans are to fasten five-inch strips of freshly tarred paper or canvas around the trunks, first mixing the tar with train oil if possible.

The canker worms may be driven out of trees that have no fruit, by syringing them with a solution made of half a pound of powdered arsenic (poison), and forty gallons of water, or with a solution of Paris green (poison). Trees in fruit may be syringed with a warm lye made from wood ashes or potash, and a little grease. This last is very unpleasant for nearly all forms of insect life. Whale-oil, soap suds or other mixtures, will perhaps prove effective.

TENT CATERPILLARS.—These are the offspring of a reddish brown moth of medium size. The best time to destroy the caterpillars is in the morning before nine o'clock, or towards evening when they are in their nests. When on small trees the nests can be pulled down with the hand and crushed under foot. A small broom or mullin stalks, fastened on a pole, and twisted around in the nests will soon entangle them. An easy method is to burn them in their nests with long petroleum torches or flambeaux. Another plan is to fasten a sponge on a pole, wet it well with liquid ammonia (hartshorn,) or naphtha, and turn it slowly in among the caterpillars. They are easily conquered, if not allowed to remain undisturbed.

THE BITTER ROT is thought to be caused by an over luxuriant growth. Retarding the growth of the tree by seeding down to clover or grass, or root pruning, or cutting a circle round the bark (girdling) or driving nails into the tree will perhaps counteract it. Most fruit are not troubled with it to any extent.

RENOVATING OLD APPLE TREES.—A little attention will often save many a fine tree. Other trees, however, that are almost dead, are sometimes better suited to the wood pile than to the pruner's saw. When trees have passed their prime, then is the time to plant out younger trees to give a supply of fruit by the time that their elders have taken their departure. When apple trees cease bearing well, and make but little new growth, the attention of the owner should first be paid to any insects or borers that may infest the bark or trunk of the trees. The rough bark may be scraped down with a blunt hoe on to a sheet made to fit around the tree, and the scrapings of insects' nests, &c., burned. The borers may also be killed with a knife or flexible wire. Next, the bark of the tree may be washed with strong soap suds or potash water, or soft soap, mixing a little sulphur with it, or other remedies previously mentioned may be used.

All sprouts or suckers should be cut away from the base of the tree, and if growing out from the branches, then only an occasional one should be left to take the place, or to be in readiness to supply the place of decaying limbs. By thinning out a few of the larger limbs, more sunlight can be let into the tree, and the roots be better enabled to support a vigorous growth in the remaining branches. The trees also now need to be stimulated into growth, and may either be manured well, or a peck each of wood ashes and air-slaked lime, and two quarts of iron filings or refuse iron, may be scattered around the tree, and plowed under quite shallow. Smaller trees, like the pear, plum, quince, &c., will require a less quantity of lime, &c.; but all should receive good cultivation for a year or two.

YIELD AND PROFITS.—The yield varies greatly according to the size of the trees; but bearing orchards usually produce from 50 to 200 barrels to the acre. Instances have come within my notice where single trees have produced from 15 to 30 bushels of marketable apples. A grower living a little below Albany, N. Y., has this past year obtained 53 barrels of choice fruit from ten trees, selling the fruit at from $3 to $5 per barrel. Frequently the yield is from four to seven barrels per tree. The sales per acre usually range from $100 to $300; though $400 per acre is not an unusual figure when prices are favorable. The fruit from single trees, in good years, have realized for their owners from $15 to $25, according to management, markets, &c.

PICKING AND MARKETING OF APPLES.—Summer and early fall apples are usually picked just before they are ripe, or while ripening. Winter varieties are left on in this latitude until about the 10th or 20th of October, or even later, but should be picked if possible before the first freezing of the ground. South of Baltimore, Md., winter apples need not usually be picked until in November; but some varieties may require to be picked a month earlier if they commence falling badly. Extra early apples are often sent to the New York markets in crates, holding about a bushel each. Usually, however, both summer and winter apples are sent in clean barrels. In summer the barrels are generally ventilated by means of holes drilled or cut in the sides and ends.

In packing apples for market, it is customary to put in two layers at the bottom, with the stems down. These, however, should be no better than the rest of the barrel's future contents. Next fill the barrel one-third full, putting the apples in rapidly, but carefully, and with the hands reaching well down into the barrel. Shake the barrel carefully now, and again when two-thirds full, also when filled. Before heading the barrel it should be nearly level full, so as to require considerable pressure upon the apples in getting the head in its place. A simple machine is often used to press the heads into position. The name of the apples or the shipping card should then be fastened on the lower head, which is the head to be opened. It pays to keep out inferior specimens, and to exert due care in pressing down the heads, that there may be no loose apples to shake around in the barrels.

DIRECTIONS FOR KEEPING APPLES.—Some persons prefer to keep the apples in heaps in the orchard, or in cool sheds, or fruit rooms, for a week or two before heading up the barrels for marketing or for keeping. Many others only cover the barrels with boards to protect from rain, or place them in sheds, and head them up later. Others head up the barrels, at once, and place them on their sides, supported on two rails. Apples to keep well should be carefully picked by hand, to avoid bruising, and only when perfectly dry. It is well to keep them in a cool shed, or protected on the north side of buildings, as late as possible in the fall before removing them to the cellar. A cool cellar ranging from 30 to 45 degrees above zero is better than a warmer one. If possible ventilate by letting in fresh air only on cool days. Freezing seldom injures apples if they are allowed to thaw out undisturbed in dark packages, and in a cool room or cellar.

An excellent method for keeping apples until late in the spring, or even longer, is to place them in boxes or barrels with *dry* saw-dust between the apples, so that the apples do not touch each other. The packages should be kept raised from the floor, and in a cool place (not moist) room or cellar. Apples may sometimes be kept even two years when packed in ground plaster (*gypsum*); while dry sand is also excellent. They can also be kept easily in shallow pits, two or three feet deep, and covered with three inches of soil. A place should be selected where the soil is porous or sandy, and the drainage good. A little straw may be placed underneath, and above the apples. Sometimes apples *in barrels* are kept in this way. Freezing does not injure them; but they should be used in April or May, taking some out every week or two as wanted.

FAVORITE MARKET VARIETIES IN NEW YORK CITY.—Popular well known varieties sell at higher prices and more quickly than unnamed or unknown sorts. The following apples are some of the principal favorites there, but the list would vary somewhat for other large cities, viz.: Red Astrachan, Sweet Bough, Fall Pippin, Primate, Twenty-Ounce, Northern Spy, Rhode Island Greening, Roxbury Russett, King of Tompkins County, Baldwin, &c. Persons desiring further information about market varieties of berries, &c., by addressing me, at Saugerties, N. Y., will receive in return my illustrated priced catalogue of fruits, which contains a number of facts of interest to those growing fruits for market or home use.

HARDY APPLES FOR MINNESOTA OR NORTHERN VERMONT.—Most apple trees when grown on land that is not too rich, will easily stand a temperature of 20 degrees below zero; but where the thermometer marks 40 degrees below, then some care is required in selecting. The Duchess of Oldenburg, Wealthy, Haas, Tetofsky and Walbridge appear to be among the most hardy. Red Astrachan, Fameuse, Pewankee, Late Strawberry, Emperor Alexander, Tallman's Sweet and Rhode Island Greening, are among the next hardiest, and will do for most places of the climate of Vermont, and in some favorable localities in Minnesota. Some of the newer varieties also promise to prove quite hardy.

APPLES FOR THE WESTERN PRAIRIES.—Most of the above hardy varieties do well on prairie soil, also Ben Davis, Early Harvest, Fall Orange, Jonathan, Maiden's Blush, Hubbardston Nonsuch, &c. At the south many of our winter apples ripen in the fall, but it is easy to ascertain from neighbors as to what are the favorite varieties in the different States. Most of the varieties mentioned in my priced catalogue will be found adapted to the New England and middle States, also to many localities in the western States, in which the climate is about the same.

PEARS.

THE PEAR (*Pyrus communis*, L.; or *Poirier*, of the French), continues to grow in public favor from year to year, and at the same time proves one of the most profitable of fruits. It has been grown in Europe and Asia for fully 2,000 years, but it is thought that it is only within the last 100 years that it has attained the perfection in flavor that now characterizes some of the popular varieties. It is widely grown in this country from Maine to Texas, and also on the Pacific coast, where beautiful large specimens are produced. Almost all soils, heavy or light, are suitable for growing it; though a good loam, if well drained, naturally or artificially, usually gives the best results.

Suggestions as to "planting," "cultivation," "pruning," "promoting fruitfulness," fertilizers, insects, "fall planting," &c., will be found under the head of Fruit Trees or Apples. Dwarf pears, which are budded on quince roots, frequently produce fruit within a year or two after planting, and require about the same treatment as the standards, though many persons prefer to plant them from two to four inches deeper than they had previously been grown.

WHEN TO GATHER PEARS.—The quality of this fruit is usually greatly improved when ripened indoors in a dark fruit room or closet. Summer pears should be picked

at least a week before ripening, and autumn varieties fully two weeks before maturing. The time to pick the different kinds, is usually when such specimens as have been worm eaten, commence to ripen ; or when the stems separate easily from the branch upon lifting the fruit with the hand. Sometimes some specimens on the same tree will not be ready to pick for a week or two later than others.

HOW TO RIPEN AND COLOR PEARS.—Having picked the fruit when dry, place it on shelves or on the floor either in shallow heaps, or each pear separated, keeping the room or closet cool and *dark*. A rich color can be given to many varieties, by placing two or three layers of the fruit, either under or between woolen blankets, either on the floor or in draws or boxes. If for market they will frequently sell at much higher rates when well colored. In ripening winter pears they should be brought out into a warmer room, as wanted, and about two weeks before their time of maturing.

METHODS OF KEEPING PEARS.—By retarding the time of ripening of such varieties as the Bartlett, Seckel, Beurré d'Anjou, &c., for a month or six weeks, nearly double the usual price can often be obtained for them. The simplest method is to place them in clean boxes or crates, directly upon the ice in an ice-house, covering the boxes a foot deep with saw-dust. Clean kegs or barrels will answer nearly as well, but the fruit should be placed in when green; and, if late fall varieties, should be removed to a warmer room to partially ripen. Fruit of nearly all kinds, even when fully ripe, may be kept a week or two longer by placing the dish containing it upon ice. Winter pears may be kept longer, by wrapping the fruit in paper previous to packing in kegs, barrels or boxes. They should not freeze, nor be placed in too warm an apartment.

YIELD AND PROFITS.—Pear trees yield from about a bushel up to two or three barrels, and sometimes more. In some orchards the average will be half a barrel to a tree, and in others a barrel. The price for *good fruit* is far from declining, but rather is improving as the country grows richer. Years ago it was thought an unusual thing to obtain $12 or $15 a barrel ; but within the last two or three years, fully double those figures have been obtained. In 1868 two barrels of fine Seckel pears, raised near the Hudson River, were sold at $40 per barrel, and more were wanted. A year or two before, two half barrels of Beurré d'Anjou were sold at $18 each. Bartletts range in price at from $4 to $15 per barrel ; usually $5 or $6 per barrel is the average price. I could mention a number of orchards of dwarf trees, planted from five to twelve years, in which the fruit is sold at the rate of from $500 to $1,500 per acre. Pears grown on dwarf trees are often extra large, and sell at times at from 10 to 15 cents each, while even 50 cents and $1 each have been obtained for single specimens of the Duchesse d'Angouleme. The fruit from standard pear trees sells frequently at from $400 to $1,000 per acre, though $200 per acre is a more usual price.

MARKETING PEARS; MARKET VARIETIES, &c.—Pears are usually shipped when green, and in either barrels or half barrels. Pears that have been colored and are partially ripe should be shipped in smaller packages, either in boxes or crates, or in flat market baskets. Extra fine specimens bring the best prices if first wrapped when partly ripe, in clean paper, and then packed in flat square boxes holding a bushel, or in half barrels. They should always be securely packed, so as to avoid shaking around and becoming bruised in transit. Among the most profitable and favorite market pears are the Bartlett, Seckel, Duchesse d'Angouleme, Beurré d'Anjou, Louise Bonne de Jersey, Beurré Bosc and Lawrence. Other favorite market varieties are Bloodgood, Clapp's Favorite, Howell, Doyenne Boussock, Sheldon, Beurré Clairgeau, Flemish Beauty, Winter Nellis, Josephine de Malines and Vicar of Winkfield. Some of the new varieties promise well, but nearly all other pears except those named above, sell at low prices in the New York city markets. Most of the above are also among the *very best* for table use.

TREATMENT OF THE PEAR BLIGHT.—The "blight" is the chief enemy of the pear, causing the wood in the branches to turn black, and gradually working its way down into the heart of the tree. Its presence may be detected by cutting into the terminal shoots with a knife. It usually occurs when the trees have not matured their growth in the fall ; or, after having prematurely dropped their foliage, a warm spell of weather has caused the sap to again ascend the branches, to be afterwards frozen during a severe winter. In many districts the "blight" is almost unknown, and in others does but little injury. When present, the branches affected, if small, should be cut back of

the discolored wood, and burned, as it is thought to be a species of fungus growth in the sap. Washing the branches with solutions of potash, or lime, or sulphur, or copperas, or carbolic acid, or with linseed oil, often seem to assist in stopping its further progress.

In *preventing* the blight, the linseed oil or other washes just named, are thought to be an assistance, if applied early in the spring. Very wet, undrained soils should be avoided; also, late summer cultivation, unless cultivation has been kept up at regular intervals during the season. Rich manuring should also be avoided on rich soils, it being better to use merely lime, wood ashes or bone-dust. Seeding down to grass or clover is often a preventive, but on poor soils, where the growth of the trees would be checked too much, it is better to resort to heavy mulching of the trees during the growing season and fall, as at present mulching appears to be the *best preventive* known. If in early spring, at time of pruning, a thick, gummy sap should appear, or soft sappy or black places on the bark be seen, it may then be known that the blight (fire-blight) is present.

NON-BLIGHTING PEARS.—The Bartlett, Seckel, Tyson, Duchesse d'Angouleme, &c., are very slightly or very seldom affected by blight, except under unusually unfavorable circumstances. Beurré Clairgeau, Lawrence, Beurré Giffard, Beurré d'Anjou, &c., are among some of the other varieties that are usually pretty free from blight. However, it should be remembered, that on most porous or well-drained soils, that nearly all the other pears mentioned in my catalogue also do well, if not improperly treated.

INSECT BLIGHT, &c.—Occasionally the twigs of pear trees are injured by a little worm, one-eighth of an inch long, causing the tips of branches to turn brown in summer, and also the leaves. Such parts should be cut out and burned. Syringing the trees in June, and also early in August, with solutions of either sulphur, whale-oil soap or hellebore, would probably protect from further attacks for that season. The slug-worm may be driven off the foliage, if it should appear in June or July, by dusting the leaves while damp with wood ashes, plaster or lime, or probably with some of the above solutions, which are usually destructive to most forms of insect life. Under the head of Fruit Trees and Apples, other suggestions will be found for destroying worms and insects.

CRACKING OF THE PEAR may be prevented, and sometimes cured, by working wood ashes into the soil, *broadcast*, at the rate of from 50 to 200 bushels to the acre, or from one to two bushels over the roots of a good-sized tree. It should not be heaped up around the tree, but spread around for 10 or 15 feet from their trunks. Powdered sulphur worked into the soil is also said to be a preventive. Possibly thinning the fruit would assist; it also has the effect of making the remaining specimens larger.

HARDY PEARS FOR NORTHERN LATITUDES.—All varieties are sufficiently hardy, if planted south of Albany, N. Y.; while many varieties are hardy in the vicinity of the great lakes, and also on the Canada side, even though in northern New Hampshire or Vermont they might not be able to stand the winters. Flemish Beauty and Louise Bonne de Jersey (dwarf) are among the hardiest for such extremely cold localities, while Clapp's Favorite, Beurré d'Anjou, Doyenne d'Ete, Rostiezer, Urbaniste, Duchesse, Seckel, Winter Nellis, and Onononda are usually hardy in not too cold districts. Bartlett, if top-worked on the Flemish Beauty, is usually hardy, and will even succeed without doing so in many northern localities, as will also the Lawrence. Possibly winter mulching might also enable many other varieties to withstand a temperature of forty degrees below zero.

PEACHES.

THE PEACH (*Persica vulgaris*, L., or *Pêcher*, of the French) is one of the most luscious of fruits, and giving a crop within one or two years after planting is also one of the most popular of fruit trees among those setting out orchards. It thrives in nearly all parts of the country, and often succeeds finely in mountainous regions, where hitherto it had been thought impossible to grow it. It can be grown on nearly all soils, but does especially well on a good loam, or a gravelly soil; it is also largely grown on sandy soils, and occasionally on clay soils. As the trees cease bearing sooner than other fruit trees, it is well to make additional plantings about every three or four years, and especially if the older trees are growing on sandy soils. Hoed crops may be grown between the trees for three or four years, and afterwards good cultivation should be given each year until about the time the fruit ripens.

PRUNING; THINNING THE FRUIT, &c.—Large branches should seldom be cut out, but an annual pruning or "shortening in" of the new wood early each spring, assists in keeping up a constant supply of fruit, as the fruit buds are produced on wood of recent growth. Strong shoots or laterals may be shortened in about one-third, and weaker ones about one-half; while others should be removed entirely when too thick. As large peaches often sell at three times the price of small ones, it pays to thin out the green fruit when too close together. It also assists in obtaining a more regular crop, and may be commenced as soon as the peaches are half an inch in diameter, and kept up if necessary until the fruit commences to color. One peach to every three or six inches may be left on the branches, though when previously shortened in, this thinning out, costing only about $10 per acre, may often be omitted. Experimenting differently on different trees, making a note of it at the time, will soon show which way will give the best results.

THE PEACH BORER (*Ægeria exitiosa*) is a thin whitish worm, sometimes growing to nearly an inch in length which girdles the tree just below the surface of the ground. The favorite method of destroying the borer is to hollow out the soil four or five inches deep in June, making a basin, and then to pour in one or two gallons of hot water. In treating young trees it may be safer to use a knife or flexible wire to kill the borers, but in bearing orchards it is quicker to use the hot water, heating it in large kettles in the orchards. Heaping up soil or coal ashes around the trees in June, first brushing around the collar of the tree with a broom, and removing the old soil and sweepings to one side, often prevents the borer from making a lodgment. In September or October the ground may be again leveled off, and either treated with hot water, or brushed well below the surface with a broom. A wash made of half a gallon each of soft soap and hot water, and four ounces of carbolic acid, with twelve gallons of cold water added afterwards, if applied early in July, will prevent the blue, four-winged, parent wasp from depositing its eggs in the trunks of the trees. Driving nails in the trees have no effect; but other washes, or a handful of wood ashes placed around the trunk might be a benefit.

TREATMENT OF THE YELLOWS.—Its appearance may be known by the tree putting out some thin, wiry laterals, upon which are produced very slender or narrow leaves of a yellowish or pale green color. The usual practice is to dig out the tree and roots and burn them, and not to plant another *peach* tree on the same spot for twelve or fifteen years. No remedy is known, and as I have had no trouble with it on my grounds I have made no experiments in that direction. The tree only would live a few years after being attacked, bearing smaller fruit each year; that is darker inside than natural, and specked, ripening also prematurely. Possibly cutting out the diseased branches, and using the hot water as described above, might be a benefit, especially if wood ashes are worked into the soil, and the branches and laterals kept well shortened in each year. As the effects of the borer are sometimes mistaken for the yellows, the hot-water treatment would save some doubtful trees. Other experiments are worth trying.

YIELD AND PROFITS; MARKETING, &c.—Peach trees yield from two to twelve peach baskets of fruit each, according to size of trees and care given. They are shipped either in bushel crates, or in round peach baskets holding from half to five-eighths of a bushel each. The price ranges from 50 cents to $5 a basket, according to the season and supply and size of fruit. The usual price is about a dollar and a quarter; while large, or very early, or very late peaches seldom sell for less than that, and often for $2 or $3 a basket. The finest peaches, and consequently the most profitable ones, are usually grown on elevated land situated within a mile or two of large bodies of water, or of large rivers. The sales per tree after they are five years planted range at from $1 to $10 each, and occasionally on large trees nearly double the last figure. The sales per acre vary considerably, amounting at times to $500 or $600 per acre, at others to about $100; but usually to $200 or $300 per acre. If the markets are near at hand, peaches, also apricots, plums, melons, &c., can be kept from two to four weeks later by placing them in crates on the ice in ice-houses, and covering with blankets, paper or other material.

PLUMS.

THE PLUM (*Prunus domestica*, L. *or Pflaumen*, of the German) under favorable circumstances is one of the most profitable fruits to grow, and usually is in great demand in the markets, either for supplying dessert tables, or for the making of preserves, pies, tarts, &c. It is usually planted on strong loams, or on gravelly or clay soils, as the curculio is generally more troublesome on light soils. However, by following the suggestions that I will offer, plums may be grown in almost all parts of the country.

PROTECTING AGAINST LATE SPRING FROSTS.—One way that is often successful in saving the blossom in May, is to heap up ice or snow around the trees in February or March, or to mulch heavily while the ground is still frozen. This often keeps the frost in the ground later, retarding the opening of the blossoms in peach, plum, or apricot trees until the spring frosts are past. Another method is to cover the trees when in blossom with carriage sheets, or paper, &c., on nights that the frost is feared. Another plan to ward off the frost from trees or vineyards, is to make a dense smoke by burning small fires in the orchard, made of gas-tar, straw, shavings, &c., thus preventing rapid radiation from the ground.

HOW TO TREAT THE BLACK KNOT.—This is about the only serious enemy or disease that the plum tree has, and being a species of fungus growth, if neglected will spread quite rapidly in an orchard. Many varieties are almost free from its attacks, and in some localities it is seldom troublesome. The black warts or knot when present should be cut out with a knife, even if obliged to cut half way into a branch or to completely sever it. The wound should then be painted with spirits of turpentine to prevent the further growth of the fungus, and afterwards, if large, should be covered with shellac varnish, liquid grafting wax or paint.

REMEDIES AGAINST THE CURCULIO.—The curculio is a small insect or beetle of about one-sixth of an inch in length, of a dark brown color, and having two little humps onits back. It cuts into the skin of plums, apricots and nectarines, and sometimes into pears, apples, cherries and peaches, making a little crescent-shaped mark in which it lays its egg. The easiest way to destroy this "little turk" is to plant the trees in a chicken yard, or build a poultry yard around the trees. It is a *sure* remedy. Trees bending over ponds or streams are also said to be free from their attacks. Dusting frequently with coal ashes, or in wet seasons with air-slaked lime, are easy remedies. Smoking or "smudging" the trees frequently, with petroleum smoke, or with burning leather or woolen rags, &c., are often successful means to employ. Syringing the young plums with a decoction of tomato leaves, or hanging tomato vines, or corn cobs sweetened in molasses, in the branches is sometimes recommended. Wood ashes or plaster, if frequently scattered over the trees while wet are said to be successful. Whale-oil soap I

consider useless, but experiments with other solutions might be tried on different trees. The "concussion theory," or firing off a small cannon in the orchard has its advocates.

The usual method however for large orchards, or even single trees, is what is known as the "jarring process." As soon as the fruit has formed, a hole two inches deep is bored into the tree with a half-inch auger, and a short iron rod of half inch diameter inserted. Two sheets, or muslin stretched on poles are then placed on the ground under the tree, and two or three sharp blows struck on the iron plug with a mallet. The curculios falling on the sheet may then be killed, or thrown into a covered box to be afterwards destroyed. Sometimes sheets with a trap underneath are arranged on a framework, on a wheelbarrow in such a way as to allow the wheel to jar against the tree. This jarring of the tree is to be kept up every morning until the fruit is quite large, and should be done in the mornings before nine o'clock. The time occupied will cost from 10 to 20 cents per tree for the season, but is well worth the trouble, as from $1 to $10, per tree may often be saved.

YIELD AND PROFITS.—The plum when cared for produces very heavy crops, yielding from half a bushel to one barrel per tree, or from 50 to 200 bushels per acre. They usually sell at from $2 to $4 per bushel, and at times for $6 or $7 per bushel. They are often shipped in half barrels or barrels before becoming ripe, and sell at from $4 to $15 per barrel at wholesale, usually at $5 or $6 per barrel. Ripe plums should only be shipped in peach baskets, or small market baskets.

NECTARINES AND APRICOTS.

THESE are delicious fruits, and often sell at high prices, owing to their earliness and delicate flavor. They ripen in July and August, before most varieties of plums, and require about the same treatment and care as peaches or plums. Many prefer to train them to walls or buildings, though they can be grown almost anywhere where the peach will thrive. They are shipped to New York, when about ripe, in strawberry quart baskets or in other small packages, and sell at from 10 to 40 cents per quart.

CHERRIES.

THE CHERRY (*Cerasus sylvestris*, L., *or Cerisier*, or the French) has been known for fully 2,000 years. It makes an excellent shade tree, and is one of the best for planting around buildings, or for giving shade along the highways, as besides affording an agreeable shade, it furnishes fruit at the rate of from $5 to $40 worth a year. Varieties bearing heart-shaped cherries are the best for shade, and are also among the most profitable. Good varieties for shade, &c., are Black Eagle, Black Tartarian, Coe's Transparent, Gov. Wood, Elton, Early Purple, Guigne, Downer's Late Red, Yellow Spanish, Napoleon Bigareau, Rockport Bigareau, &c.

SOILS, PRUNING, &c.—Though the cherry can be grown on all soils, except those that are very wet, still it succeeds best on gravelly or dry soils. It should seldom be pruned; summer "pinching in" being the best course to follow, and then only for a few years. Mulching the first season is to be highly recommended. The tree has but few diseases, and is not much troubled with insects. On soils where the trees are accustomed to split open their bark, it is better to have the lowest branches within three or

four feet of the ground. In colder localities than this, the Dukes and Morello varieties of cherries can often be grown, when the others are not sufficiently hardy. Fine thread, wound around the trees when in fruit is said to frighten away the birds. Old seines, or fish nets might also be worth trying. Root pruning often adds to the fruitfulness of the trees.

KEEPING CHERRIES, PEACHES, GRAPES, &c.—It is said that almost all fruits may be kept for a year, retaining their *full flavor*, by first washing them and then placing them in a solution, made of one quart of *pure* water, 200 or 300 grains (½ to ¾ ounce) of pure sugar, and two and a half grains to three of salicylic acid. Next, tie common wrapping paper tightly over the bottles or jars, and keep in an even temperature.

YIELD AND PROFITS, MARKETING, &c.—Good-sized trees usually produce from one to five bushels each, or from 100 to 200 bushels per acre. The price in market ranges from $2.50 to $6 per bushel, and occasionally, though very rarely, as high as $10 per bushel. A fruit grower near Albany sold from two trees about $70 worth of fruit in one year. The usual price is about $3 or $4 per bushel. Cherries are shipped to New York city markets in grape boxes, holding from 20 to 30 pounds each, or in peach or flat market baskets, and occasionally in strawberry quart baskets and crates. The fruit should only be picked when perfectly dry, if for shipping, and with the stems attached.

QUINCES.

THIS FRUIT (*Cydonia vulgaris*) has been known about as long as the cherry, and owing to its beautiful and showy blossoms and bright-colored fruit, is often planted as an ornamental shrub or small tree. It is one of the most profitable fruit to grow in places where it succeeds well, and does best if planted on a deep, rich, moist or clayey loam. The trees require but little pruning, except to pinch in side shoots when too thick, and to cut out any decaying limbs.

CULTIVATION, MANURING, &c.—The best results are obtained by cultivating thoroughly. Muck, if sweetened by the frost, is excellent to fork in around the trees in spring, and plenty of old manure in the fall. If salt is applied broadcast annually at the rate of five bushels per acre on poor soils, or ten bushels on rich soils, it will add greatly to their fruitfulness. This amount of salt would injure some fruits or plants, but not quinces. Thinning out the fruit *pays* if it is thick, as large and fair quinces bring handsome prices. The borer may be excluded in the same way as from the apple.

YIELD AND PROFITS, MARKETING, &c.—Trees planted only three or four years often yield a peck each, while larger trees produce from half a bushel to a barrel each. Usually about 300 or 400 trees are planted to the acre, yielding generally over half a bushel each on an average. The price varies greatly, though the fruit is always in great demand for making marmalades, jellies, &c., or for drying to be used with other fruits, which it generally improves greatly in flavor, either when canned or stewed with them. Quinces are sent to New York markets in October and November, picking them when well colored, and packing them *tightly* in barrels the same as apples, or in large baskets. At retail they are sold at from one to three cents each in lots of 50 or 100, and at wholesale at from $3 to $12 per barrel, though usually at $5 or $6 per barrel. Within two or three years some extra nice quinces have sold as high as $6 and $8 per bushel.

FIGS.

THE FIG (*Ficus carica*, L., or *Figuier*, of the French), is pleasant to have as a rarity—and, by giving winter protection, will ripen its fruit in most of the northern States. Soil that is neither too wet nor too sandy should be selected, and if the bushes are left out doors during the winter, then north of Philadelphia or Cincinnati the branches should be bent down to the ground and covered with three or four inches of soil, to be left on until frosts are over. South of Virginia no protection is needed, while between these points a covering of straw or evergreens is sufficient. Root pruning each November is almost a necessary means to employ in obtaining much fruit.

Many prefer to grow them in tubs, placing the bushes in the cellar in November, and taking them out into the open air in May, after the frosts have ceased. Others keep soil around the roots all the year, taking them out of the cellar or boxes each May. Rich manuring should be avoided. The fruit will ripen more evenly in August, and be much finer if each fruit bud is touched with a drop of sweet oil in May while small.

ASPARAGUS.

AS this vegetable is grown by nearly all fruit growers, I accordingly will now refer to it, as it may be an accommodation to others for me to do so. Asparagus usually sells at a good price, and being ready for market in April and May, the income derived from it is especially appreciated at that time of the year. It is usually planted on light soils to have it early, though it can be easily grown on nearly all good garden soils. The sprouts are not usually cut until the second or third year after planting, except to mow down the canes in the fall. The roots will give good crops for from 15 to 30 years, selling at from $100 to $400 per acre, usually about $250 per acre.

In preparing asparagus for market, it is customary to cut the sprouts about 4 or 5 inches under ground, and when only from 2 to 4 inches high. They are then tied firmly in bunches with two strings, having each bunch about four inches in diameter across the butts, and are shipped in covered crates holding about a bushel and a half. Plant the roots in spring or fall from 4 to 6 inches deep, covering with only 3 inches of soil at first, and filling in the trenches as the plants get a few inches high. Keep well cultivated the first year or two, and afterwards only very early in the spring, and again in July or August if desired. Salt spread broadcast early in spring, at the rate of 5 or 10 bushels per acre, is an excellent fertilizer, and with a good top dressing of stable manure in November is all that is necessary.

RHUBARB.

RHUBARB (pie-plant) is usually in great demand for pies, tarts, sauce, &c., as it is in its prime previous to the appearance of the fruits that are used for such purposes. Its growth may be hastened in the spring by inverting barrels over the plants. The stalks when 15 or 18 inches long are pulled, and tied in bundles of 3 or 4 inches diameter, cutting off all except an inch or two of the leaves. They are shipped in crates or ventilated boxes, and usually sell at from 4 to 15 cents per bunch, according to earliness, thickness of stalks, &c., but usually at 5 or 6 cents each

If planted on clay soils, such soils may be kept from baking by cultivating after each hard rain when not too wet. Draining is also often completely successful. Another partially successful way, is to plow under coarse manure thickly, or coal ashes two or three inches deep. Coal ashes only have a mechanical effect, unless wood ashes are mixed with them when making up fires. A forkful of rotted manure placed over each hill in November, is excellent, and should be forked under early the following spring.

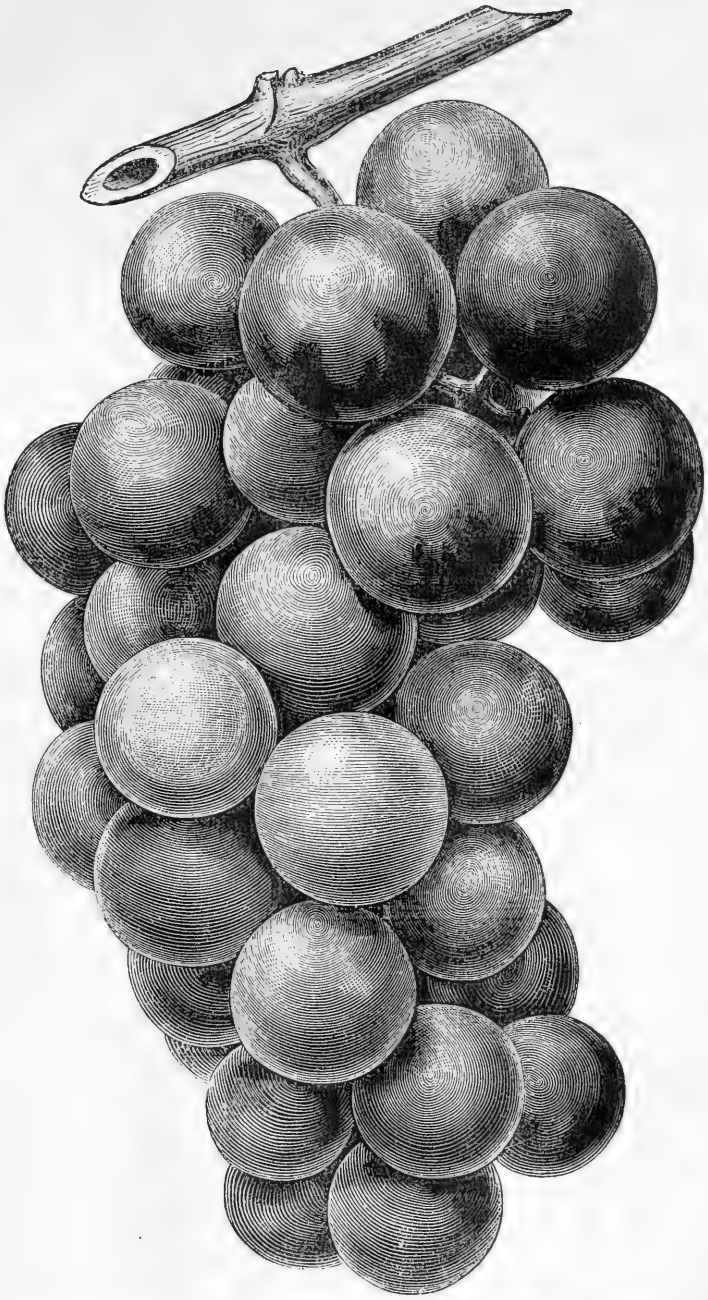
MISCELLANEOUS.

LIQUID GRAFTING WAX.—This may be made ready for use, and kept in bottles for years, by heating 1 lb. of common rosin slowly, and then stirring in 1 oz. of beef tallow; when a little cooler stir in a tablespoonful of spirits of turpentine, and then add 7 ozs. of alcohol *while still warm.* If it should become thickened by keeping, then warm the grafting wax slowly, and add more alcohol. Shellac varnish, which is often used for keeping the air and rain out of large wounds from pruning, or from cutting out the black-knot in plum trees, is made by merely dissolving ¼ lb. of gum shellac in a pint of alcohol. It should be prepared a few days before wanted for use, and will keep for years in well-stopped bottles.

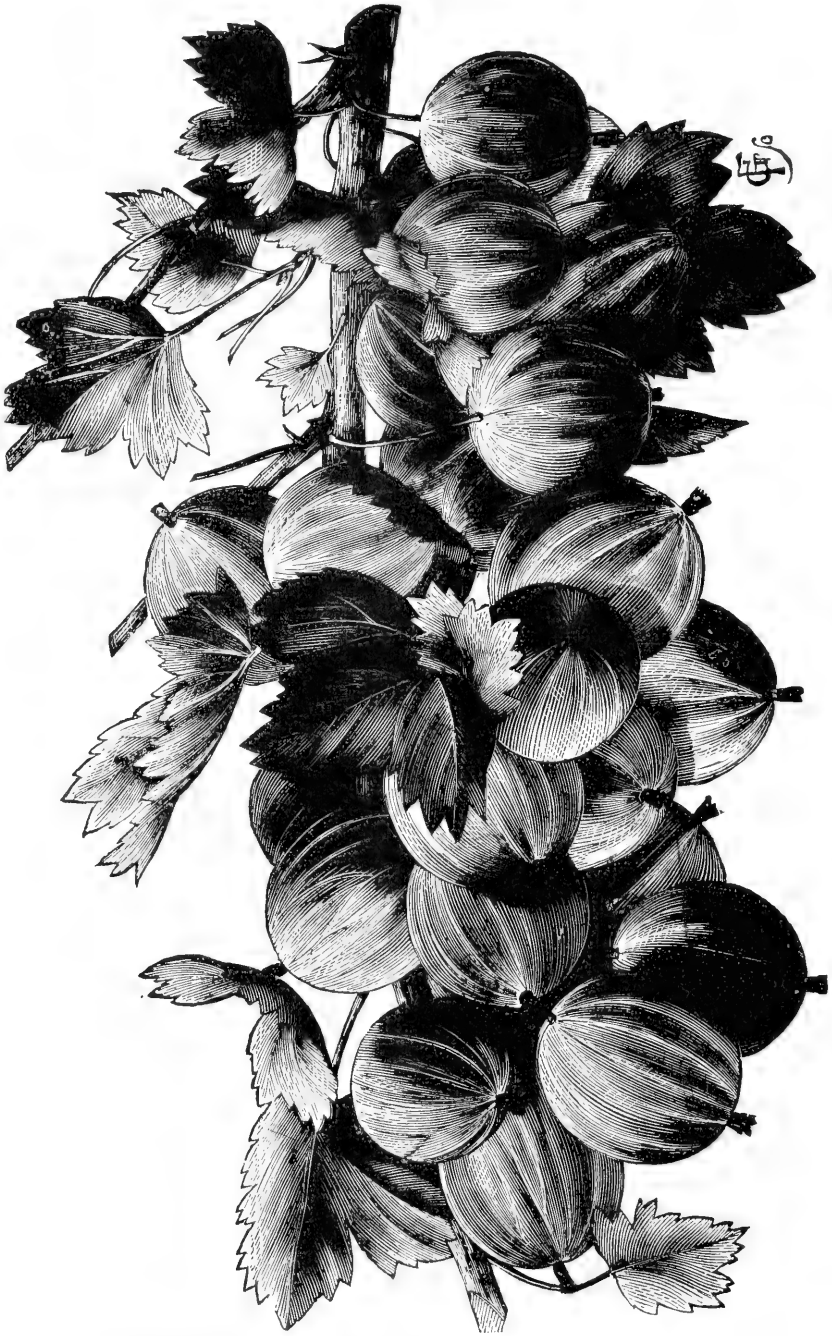
GRAFTING WAX; GRAFTING, &c.—This wax may be made by melting slowly 4 lbs. of common rosin, and 1 lb. each of beeswax and tallow. Some persons use a larger proportion of rosin. When nearly cold it may be made into sticks an inch thick, and kept in water for a year or two, if necessary. The use of lard or butter on the hands prevents the wax from sticking to the hands when grafting. If cherries are to be grafted, it should be done *very early* in the spring, before the buds swell, or just as the snow is about disappearing. Plums, also, should be grafted quite early, if at all. Pears and apples later, but before the buds open, if possible. Success, however, is often obtained in grafting apples even when in blossom, if the cions or grafts have been cut very early, or in winter, and kept buried in wet sand or sawdust in the cellar, or buried in the shade of a building, or if obtained from further north. Budding of peaches, plums, apricots, cherries, pears, &c., is performed in July, August, and September, when the bark separates easily from the wood.

FRUIT ROOMS.—If under the house, it is well to have the ceiling plastered to prevent unhealthy effects from decaying fruit. If under barns or stables, or in them, then all unpleasant odors should be kept away from the fruit. They should always be arranged so as to let in cool air when desired. If convenient, it is better to have apples kept in a separate apartment, but not necessary. Sometimes a small building can be cheaply made into fruit rooms, by filling in the siding with sawdust, or spent tan-bark. If erecting a building on purpose, then the walls and ceiling should be double, using tongued and grooved boards inside and out, and filling in with six inches in width of sawdust, &c. If good drainage can be obtained, it is well to have the room partly under ground; otherwise it is better to heap up the earth high around the outside. The floor may be either of boards, gravel, or cement. The building should have double windows and doors, so as to keep warm in winter, and cool in summer.

Another method is to have the fruit house in the side of a hill, making the walls of brick or stone, and having a double roof, packed between with one or two feet of salt hay or sawdust. It is well to have the roof to reach pretty near the ground. Even a small house, ten or twelve feet square inside, and eight feet high, will hold a large amount of fruit, and when kept cool inside will keep early apples or pears until winter, and winter apples for a year or more. When properly made and regulated, a fruit house will add greatly to the enjoyment to be obtained from fruits.



MOORE'S EARLY GRAPE.



DOWNING'S SEEDLING.